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Yosemite National Park
Yosemite, California

Bridalveil Fall Rehabilitation

Environmental Assessment

February 2018

BRIDALVEIL FALL REHABILITATION ENVIRONMENTAL ASSESSMENT

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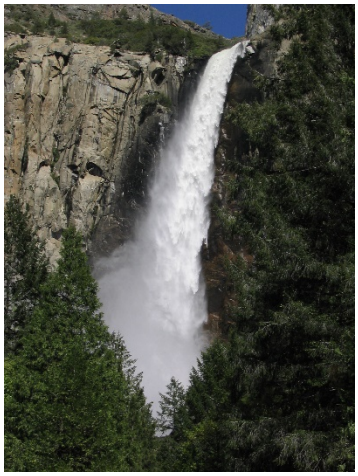
CHAPTER 1: PURPOSE AND NEED

INTRODUCTION

The National Park Service (NPS) proposes to improve visitor facilities and services at Bridalveil Fall in Yosemite Valley, California. This environmental assessment (EA) identifies and evaluates three alternatives for the rehabilitation of the Bridalveil Fall area (Figure 1-1). This document is intended to meet the environmental analysis and public review requirements of section 102(2) (C) of the National Environmental Policy Act (NEPA). The park coordinated the requirements of Section 106 of the National Historic Preservation Act (NHPA) with the NEPA process. The project tiers off the *Merced Wild and Scenic River Comprehensive Management Plan Environmental Impact Statement and Record of Decision* (*Merced River Plan*) (NPS 2014).



BRIDALVEIL FALL

PURPOSE AND NEED FOR THE PROJECT

Purpose

Plunging 617 feet, Bridalveil Fall is the first grand waterfall that most visitors encounter upon entering Yosemite Valley. Visitors can park and walk a short distance to reach the base of the iconic waterfall. The purpose of the Bridalveil Fall Rehabilitation Project is to rehabilitate visitor facilities at the base of Bridalveil Fall and surrounding area.

The project would:

- Improve visitor services at Bridalveil Fall, including restroom facilities (*Merced River Plan* pg. 8-74).
- Protect natural and cultural resources in the area.
- Reduce crowding on the trails and the viewing platform (*Merced River Plan* pg. 8-74).
- Improve safety and congestion in and around the parking lot and along Southside Drive.
- Improve interpretation and wayfinding.
- Improve accessibility for visitors (*Merced River Plan* pg. 8-74).
- Correct long-standing maintenance issues and address deferred maintenance.
- Remove selected trees to open scenic views of the fall (*Merced River Plan* pg. 8-73 and Appendix H).

Figure 1-1. Regional Location Map

Need

Bridalveil Fall typically flows throughout the year, promoting year-round visitation and high volumes of visitor use during spring and summer flows. Visitors to the Bridalveil Fall area encounter low-functioning vault toilets with long lines, congestion in and around the parking lot, busy trails, a crowded viewing platform, a lack of accessible path of travel to a viewing platform, and unclear wayfinding. The project considers a range of options to address these issues including replacement of the four inadequate vault toilets at the parking area with flush toilets and creating an accessible loop trail to reduce crowding.

PUBLIC INVOLVEMENT

Yosemite National Park conducted a 30-day public scoping period for the Bridalveil Fall Rehabilitation Project from April 26, 2017 through May 26, 2017. The NPS provided information to the public in the form of an electronic newsletter; press release; NPS Planning, Environment, and Public Comment (PEPC) website; media interviews; and a public open house. During the public scoping period, the park received 22 correspondences, generating 77 individual substantive comments. All comments, substantive or non-substantive, received during the scoping period were duly considered and are now part of the decision file for this project. A comment is considered substantive if it raises specific issues or concerns regarding the project or the study process, but not if it merely expresses support for or opposition to the project or a particular alternative.

ISSUES AND CONCERNS ADDRESSED IN THIS DOCUMENT

Table 1-1 lists the issues and concerns identified during the public scoping process.

Table 1-1. Public Issues, Comments, and Concerns

Topic	Comment or Concern
Visitor Facilities	Most commenters requested that the NPS update and improve the existing restrooms, while one group considered whether restrooms are necessary at the site.
	The NPS should expand the trail system around the exterior of the parking lot to separate vehicle and pedestrian traffic.
	The NPS should ensure that trails are accessible to all.
	The NPS should add interpretive signage to the area.
	The NPS should minimize interpretive and wayfinding signage and consider electronic alternatives.
	The NPS should include more roadway signage to help direct traffic and alleviate congestion.
	The NPS should include more signage to improve pedestrian wayfinding.
	The NPS should provide upgraded trash receptacles.
Park Management	The NPS should improve roadway safety and address traffic congestion in the area.
	The NPS should make safety improvements to trails in the area.

Table 1-1. Public Issues, Comments, and Concerns

Topic	Comment or Concern
Natural Resources	The NPS should protect natural resources in the park.
	The NPS should reduce wildlife vehicular deaths.
Cultural Resources	The NPS should consult with tribes and agency interests regarding historic properties and monitor impacts to cultural resources.
	The NPS should protect views from and toward historic structures, sites, and areas.
	The NPS should provide a place of quiet reflection to honor the cultural significance of the area.
Scenic Resources	The NPS should protect the natural beauty of the area.
	The NPS should clear vistas to improve views.
Air Quality	The NPS should promote the shuttle system to reduce carbon dioxide emissions.
Visitor Experience	The NPS should improve interpretive displays.
	The NPS should address congestion and crowding on the viewing platform and trails.
Transportation	The NPS should enhance the shuttle system.
	The NPS should reduce vehicle congestion and traffic.
	The NPS should limit parking.
	The NPS should increase parking due to high demand.
	The NPS should improve traffic circulation to reduce congestion.
Other	The NPS should identify the funding source and the total cost for the project.

ISSUES AND CONCERNS BEYOND THE SCOPE OF THIS PROJECT

The planning team considered the following issue to be beyond the scope of this project:

- Yosemite Valley lacks a bicycle circulation plan that would provide defined pathways to Bridalveil Fall.

The park considers this issue outside the scope and purpose and need for the project because it would require extensive planning, design, and compliance throughout Yosemite Valley outside the geographic extent of the project. Bicycle circulation in Yosemite Valley requires analysis from a Valley-wide perspective. Because the scale required for appropriate bicycle planning far exceeds the scale of the proposed action, this comment has been determined to be beyond the scope of this analysis. In addition, funding for compliance and implementation of a bicycle circulation plan is not available to add to the project at this time.

RELATIONSHIP OF THE PROJECT TO THE MERCED RIVER PLAN

All of the Bridalveil Fall Rehabilitation project area is within the Merced River Wild and Scenic River corridor with the exception of the viewing platform. The *Merced River Plan* provides specific direction for the Bridalveil Fall Rehabilitation Project as follows:

- Reduce crowding at Bridalveil Fall by redesigning or improving trails, parking areas, and the viewing platform below the fall.
- Extend the viewing area trail to a loop, if possible.
- Improve accessibility and restrooms.
- Expand the Yosemite Valley shuttle service to Bridalveil with a 60-minute interval between buses (summer only).

Land management within the corridor must also be consistent with the *Merced River Plan*, as described below.

River Segment Classification

The Wild and Scenic Rivers Act directs agencies to classify and administer rivers based on the type and intensity of development existing at the time of their designation. The classification of a river segment provides a general framework for the type and intensity of land management activities that may take place in the future. The Bridalveil Fall project area is in Segment 2B: West Valley, classified as Scenic. Scenic rivers are those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads[1].

"Scenic" river segments retain their overall natural character but may have structures or a concentration of structures in short reaches of the total area. The *Merced River Plan* describes Segment 2B: West Valley as free of impoundments with exceptional water quality, a largely primitive and undeveloped shoreline, with some picnic areas, parking lots, and restrooms (*Merced River Plan* pg. 3-4 and Table 3-1).

[1] 47 Fed. Reg. 39457-58.

Free-flowing Condition and River Resources

Section 7 of the Wild and Scenic Rivers Act requires managing agencies to apply a rigorous and consistent process to protect the free-flowing condition and the river resources within the bed and banks of a designated river. Projects carried out on tributaries to the Merced River, such as Bridalveil Creek, must not have the potential to affect the free-flow of the river, or affect scenic, recreational, fish, or wildlife values. The NPS evaluated actions on Bridalveil Creek to ensure they do not invade the area or unreasonable diminish these values using the process described in the *Merced River Plan* (see Appendix A for Wild and Scenic Rivers Act Section 7 Determination).

River Values

The NPS must manage the Merced River corridor to protect and enhance the values that led to its inclusion in the Wild and Scenic Rivers System. River values, as defined in the *Merced River Plan*, are the river's (1) free-flowing condition, (2) water quality, and (3) outstandingly remarkable values (ORVs). The *Merced River Plan* identifies the ORVs in the Bridalveil Fall project area (Segment 2B: West Valley pgs. 5-3 to 5-4, Table 5-1) as:

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

Geological/Hydrological. The Merced River from Happy Isles to the west end of Yosemite Valley provides an outstanding example of a rare, mid-elevation alluvial river.

Cultural. Yosemite Valley American Indian ethnographic resources include a linked landscape of traditional-use plant populations as well as the ongoing traditional cultural practices that reflect the intricate continuing relationship between indigenous peoples of the Yosemite region and the Merced River in Yosemite Valley.

The Yosemite Valley Archeological District is an unusually rich and linked landscape that contains dense concentrations of resources that represent thousands of years of human settlement.

The Yosemite Valley Historic District represents a linked landscape of river-related or river-dependent, rare, unique or exemplary contributing resources that bear witness to the historical significance of the river system.

Scenic. Visitors to Yosemite Valley experience views of some of the world's most iconic scenery, with the river and meadows forming a placid foreground to towering cliffs and waterfalls.

Recreational. Visitors to Yosemite Valley enjoy a wide variety of river-related recreational activities in the Valley's extraordinary setting along the Merced River.

The *Merced River Plan* describes the process for protecting and enhancing each ORV. Each ORV has specific indicators, standards, and trigger points. The *Merced River Plan* identifies two ORVs in the Bridalveil Fall project area with management concerns that require action:

- Scenic ORV – For scenic segments like Segment 2B: West Valley, actions must retain the existing character of the landscape and changes in the landscape should be minimal. Management activities may be noticeable, but they should not attract attention. Any changes must repeat or maintain basic elements of form, line, color, and texture found in predominant natural features and characteristics of the broader landscape *(Merced River Plan* pg. 5-113).
- Recreational ORV –The *Merced River Plan* specifies that the acceptable visitor density at the platform is 20 square feet per person (*Merced River Plan* pg. 5-134, Table 5-47). The *Merced River Plan* commits to redesigning access and parking at Bridalveil Fall to improve visitor access and provide less crowded conditions (*Merced River Plan* pgs. 5-138-139).

CHAPTER 2: ALTERNATIVES

This chapter describes the three alternatives associated with the Bridalveil Fall Rehabilitation Project. Alternative 1 (No Action) represents a continuation of current management practices and provides a frame of reference for the action alternatives, Alternative 2 and Alternative 3 (Preferred Alternative). This chapter also lists the actions common to Alternatives 2 and 3, describes the actions considered but dismissed from detailed analysis, and identifies the agency's environmentally preferable alternative. This chapter concludes with a summary of the alternatives and a summarized comparison of the environmental consequences of each alternative.

ALTERNATIVE 1 – THE NO ACTION ALTERNATIVE

NEPA regulations require analysis of a "No Action" alternative in all NEPA documents. Under the No Action Alternative, Yosemite National Park would not rehabilitate or repair visitor facilities or services below Bridalveil Fall with the exception of emergency repairs and routine and periodic maintenance activities. There would be no improvements to visitor experience, scenic vistas, visitor safety, or congestion; the park would not meet accessibility standards; and the park would not correct long-standing maintenance issues. Maintenance and repair needs would likely increase with continued visitation and aging infrastructure. Figure 2-1 depicts the existing conditions at Bridalveil Fall.

Parking Lot and Entrance

The existing parking lot for Bridalveil Fall is accessible from Wawona Road by a single combined entrance/exit road. The park would reconfigure the existing parking lot footprint to add 20-24 parking spaces for a total of about 80 spaces (including four accessible spaces). The lot is located outside of the rockfall hazard line. Portions of the parking lot flood during periods of high water flows.

Comfort Station

The existing comfort station at the southeast side of the parking lot consists of four vault toilets. The vault toilets are located in a heavily shaded area, which leads to inefficient ventilation and ongoing maintenance problems. In addition, the number of toilets is insufficient to accommodate the large number of visitors.

Bridalveil Straight

Bridalveil Straight is a segment of Southside Drive in Yosemite Valley at the point where drivers first see dramatic views of El Capitan to the north and Bridalveil Fall to the south (Figure 2-1). There is roadside parking available on both sides of the road and two lanes of one-way traffic. The area is congested during peak visitation periods and visitors often walk on the pavement directly adjacent to moving vehicles. Vehicles pulling out of parking spaces must avoid pedestrians as well as other vehicles.

There is no dedicated area for commercial tour bus parking. Buses may park on both sides of Southside Drive. Commercial tour buses parked on the north side of Southside Drive must open their doors into the traffic lane, creating potential safety hazards. There is a park shuttle bus stop on the south side of the road.

Trails, Bridges, and Viewing Areas

The Bridalveil Fall Trail follows the alignment of a carriage road built by the United States (U.S.) Cavalry, which managed Yosemite National Park from 1890–1914. The trail extends from the Bridalveil Fall parking area to Southside Drive, a distance of approximately 0.4 mile. The majority of the trail is paved with asphalt; however, the portion of the trail from Bridge Number 3 to Southside Drive is dirt, lined with stones. This trail includes three bridges that span the braided streams of Bridalveil Creek. In addition, a paved trail leads from the Bridalveil Fall trail to the paved viewing platform (roughly 400 square feet) below Bridalveil Fall.

The section of the trail from Bridalveil Straight to the east bridge (Bridge 3) is unpaved; the rest of the trail is paved (Figure 2-1).

Accessibility, Interpretation, and Wayfinding

Currently, the majority of trails at Bridalveil Fall are not compliant with accessibility standards due to steep grades. The trail from Bridalveil Straight to the viewing platform is not accessible because it is unpaved and has non-compliant steps that lead up to Bridge 3.

ACTIONS COMMON TO ALTERNATIVES 2 AND 3

The following actions are an integral part of all of the action alternatives. Figures 2-2 through 2-9 illustrate the project components for each of the alternatives. Numbers inserted into the text (in parentheses) correspond to the callouts on maps in Figures 2-2 through 2-9. Tables 2-2 and 2-3 summarize project components for each alternative.

Parking Lot and Parking Entrance

Both action alternatives would designate a right-hand turning lane and a left-hand turning lane from Wawona Road into the parking lot (4). The northbound right-hand turning lane would function as a de-acceleration lane for cars coming down the grade on Wawona Road. This de-acceleration lane would also provide space for queueing cars as they enter the lot.

The park would reconfigure the existing parking lot footprint to add 20-24 parking spaces for a total of about 80 spaces (including four accessible spaces) (1). In addition, there would be space added for service vehicle parking near the accessible spaces. The existing footprint of the parking lot would not increase. The lot would be repaved and restriped to improve parking efficiency. The intent of this plan is to retain the current parking capacity in west Yosemite Valley (as prescribed in the *Merced River Plan*). Parking added to the Bridalveil Parking Lot (3) as it is reorganized in the same footprint will be balanced by removing parking along Bridalveil Straight.

The northeast end of the parking lot would be raised a maximum of 18 inches to be above high water levels and damaged culverts and headwalls would be reconstructed (1). A formal trail would be added in the center island for pedestrians to safely move from the north to the south side of the parking lot (5). Additional amenities would include bear boxes, animal-proof trash and recycling receptacles or an additional animal-proof dumpster.

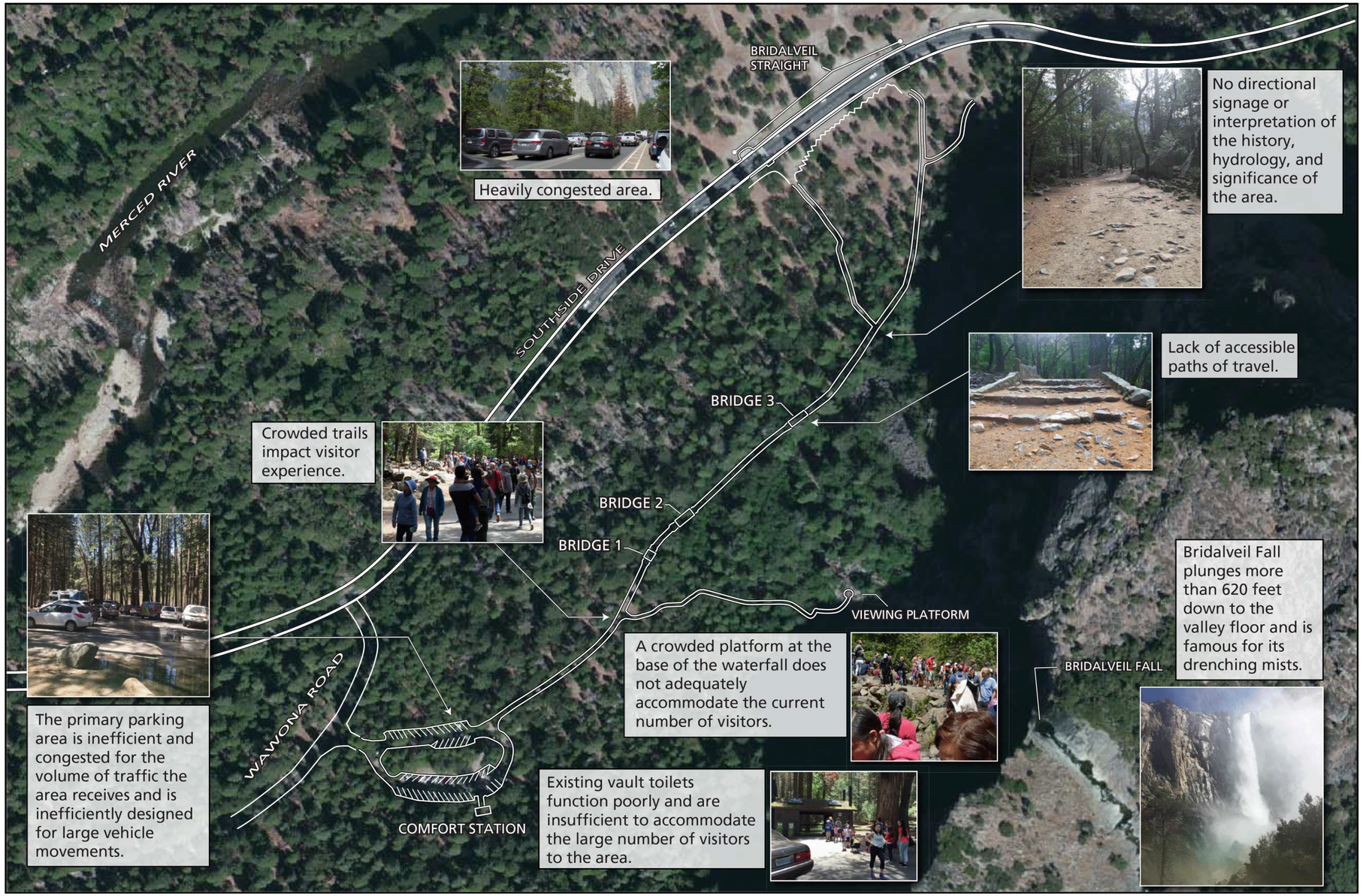


Figure 2-1. Existing Conditions – Alternative 1 (No Action)

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Comfort Station

Under Alternatives 2 and 3, the existing comfort station with four vault toilets at the parking lot would be replaced with a new 40-foot 8-inch by 25-foot 6-inch building with flush toilets (14 stalls) (12) (Figure 2-10). The new comfort station would be located in the same general area as the current comfort station. New infrastructure for the flush toilets (including new sewer, electrical lines, transformer, well pump, control panel, water tank, and sewer lift station) would be installed (13). Electrical and sewer for the flush toilets would be connected to the main lines at Northside Drive near Pohono Bridge. This would require approximately 1 mile of trenching or directional drilling in Wawona Road/Southside Drive up to Pohono Bridge, where the lines would cross as part of the bridge. A transformer would be added at Pohono Bridge. If trenching were used to install electrical and sewer, the ground disturbance from trenching would be approximately 3 feet wide and 4 feet deep. If directional drilling were used, the ground disturbance would only occur where the borer enters the ground at specific intervals along the route, and the lines would be approximately 3 to 4 feet deep. The sewer borehole would be about 8 inches in diameter. The borehole for power would be smaller. Electrical and sewer lines would be placed within the existing road footprint and bridge deck.

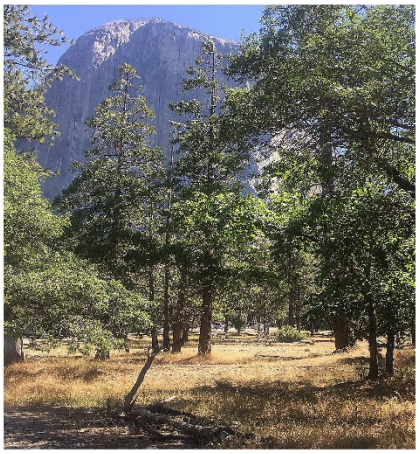
A new gathering, viewing, and orientation plaza would be added near the restrooms. The plaza would include benches and orientation signage and would be hardened with an accessibility acceptable surface (2).

Bridalveil Straight

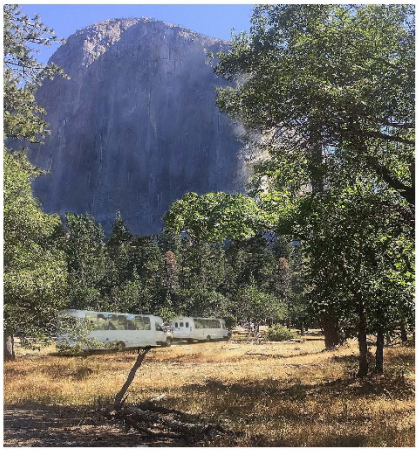
Both action alternatives would designate a commercial tour bus parking area on the south side of Southside Drive between the intersection of Wawona Road and the east end of Bridalveil Straight (6). This area was formerly ad hoc tour bus and private vehicle parking. Commercial tour buses would be permitted to park only on the south side of Southside Drive. In addition, the crosswalk in the center of Bridalveil Straight would be installed to connect to the Valley Loop Trail (10). Advance warnings and a 20-foot-long no parking zone would be added to the west side of crosswalks.

Road striping on the west end of Southside Drive at Bridalveil Straight would be reconfigured to shift the vehicle travel lanes to the north. A pedestrian path would be delineated on the south road shoulder, on the west end of Bridalveil Straight between the bus parking and the Bridalveil Creek culverts. Pedestrian traffic would be directed to the east.

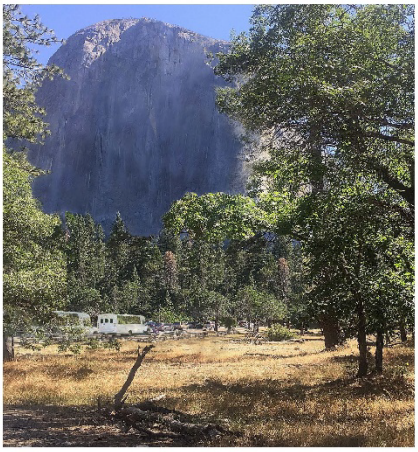
A gathering area with views of Bridalveil Fall and El Capitan, approximately 2,700 square feet in size, would be added on the south side of Southside Drive (8). Less than 10 conifers would be selectively removed to enhance the view of El Capitan. This area would include benches and interpretive/orientation signs and would be hardened with an accessibility acceptable surface. The unpaved portion of the trail between the new gathering area and Bridge 3 would be formalized and would be hardened with an accessibility acceptable surface.



VIEWING AREA BEFORE TREE REMOVAL



ALTERNATIVE 2 WITH PARALLEL BUS PARKING



ALTERNATIVE 3 WITH ANGLED BUS PARKING

Trails, Bridges, and Viewing Areas

Under both action alternatives, the park would add a new 8-foot to 10-foot-wide accessible loop trail from the parking lot to a viewing platform (14). While the majority of the trail would be at-grade and hardened with an accessibility acceptable surface, portions of the trail would be elevated to cross sensitive areas and large boulders with minimal ground disturbance. The elevated portions of the trail would be accessible and constructed of metal (aluminum or steel) and wood decking (Figure 2-11). This new loop trail would intersect with the trail that leads from the Bridalveil Fall Trail to the existing viewing platform about half way up from its intersection with the Bridalveil Fall Trail. The park would construct an additional platform with views of the fall along the new accessible trail. The segment of the accessible trail leading directly up to the existing platform (14) may be constructed at a later date depending on funding availability. Locations of all new trails were selected with input from Tribal representatives and Park Cultural Resource staff to avoid known archeological sites and areas of religious and cultural significance.

Under both action alternatives, the trail connecting the Bridalveil Fall Trail east of Bridge 3 and the new pedestrian plaza on the south side of Bridalveil Straight would be hardened with an accessibility acceptable surface and made consistent at approximately 12 feet wide (15). The Bridalveil Fall Trail east of Bridge 3 to where it meets the Valley Loop Trail further to the east would be repaired and resurfaced with an accessibility acceptable surface. To meet accessibility standards, the steps that lead up to Bridge 3 along the Bridalveil Fall Trail would be replaced with accessible trail tread that would be hardened with an accessibility acceptable surface. The existing trail from the Bridalveil Fall Trail to the viewing platform would be reconstructed to be a minimum of 8 feet wide with stairs (to code) as needed.

The intersection of the Bridalveil Fall Trail and the trail to the existing viewing platform would be expanded for interpretation, viewing, and gathering (approximately 1,300 square feet) (16). A new viewing area would be added to the northeast side of Bridge 3, adjacent to the Bridalveil Fall Trail (approximately 100 square feet in size) (11). In addition, NPS would improve access to and delineate the viewing area at the southwest side of Bridge 3 (100 square feet). Improvements would be minor – no blasting, rock removal, or heavy grading (7). Trail decking, railings, and site furnishings will be constructed using robust decay-resistant materials, such as Alaska yellow cedar, that do not require toxic preservative treatments.

VIEWING AREA SOUTHWEST OF BRIDGE 3

Conifers would be selectively cleared from new and existing viewpoints to enhance views (less than 100 trees). In addition, to improve habitat and sustain the health of mature California black oaks, the park would remove small conifer trees (less than 20 inches diameter at breast height [dbh]) that are growing within the dripline (defined by the outermost circumference of a tree canopy) of selected mature oaks in the project area (less than 40 small trees cut at ground level).

Accessibility, Interpretation, and Wayfinding

Both action alternatives would include a suite of accessibility improvements. All new trails and pathways would be constructed to meet accessibility standards. There would be accessible parking spaces added to the parking lot and Bridalveil Straight, creating a fully accessible path from both parking areas to viewing areas. All new interpretive material and signage would be designed with proper fonts, heights, and contrast for added visibility. The comfort station would be fully accessible.

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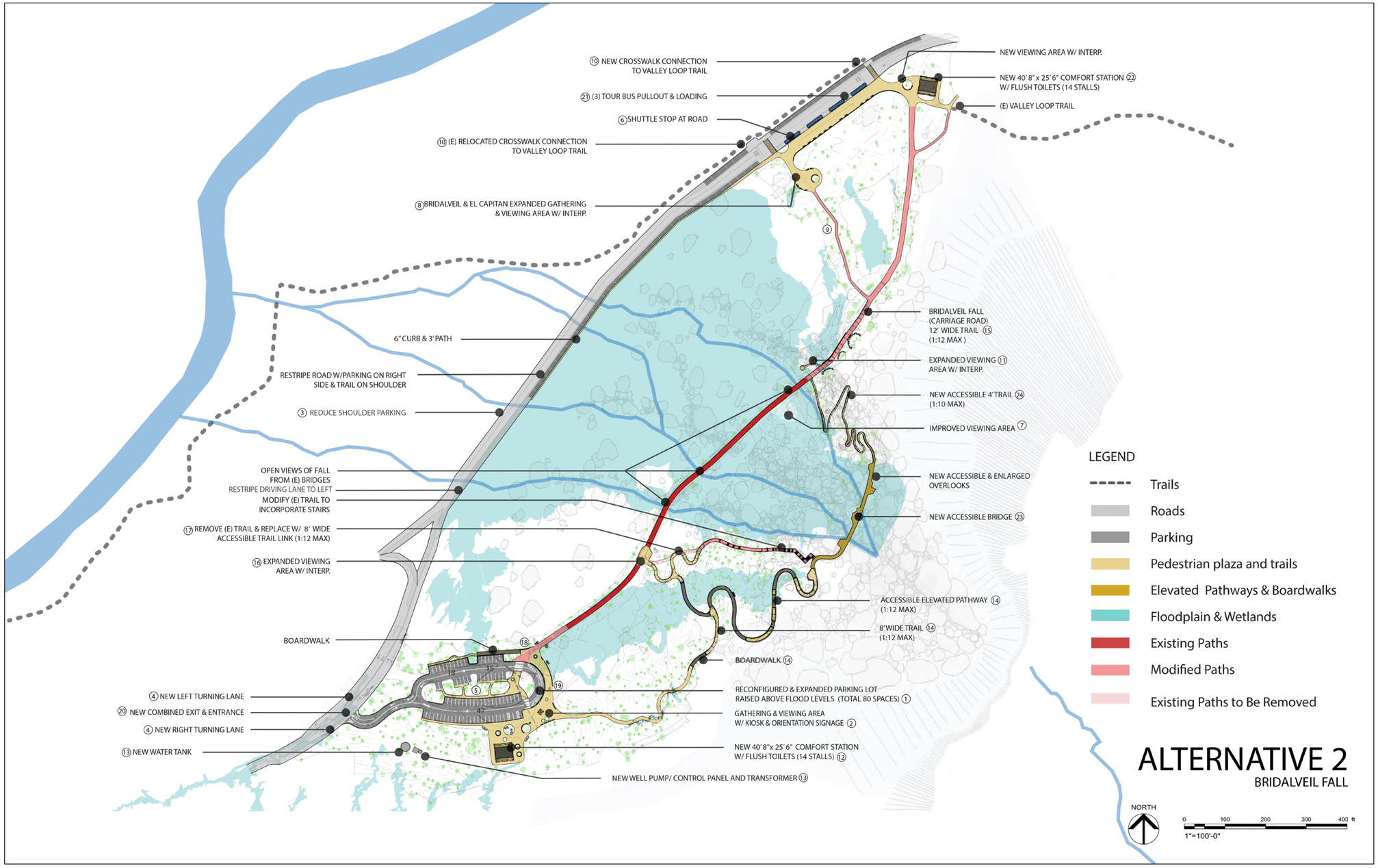
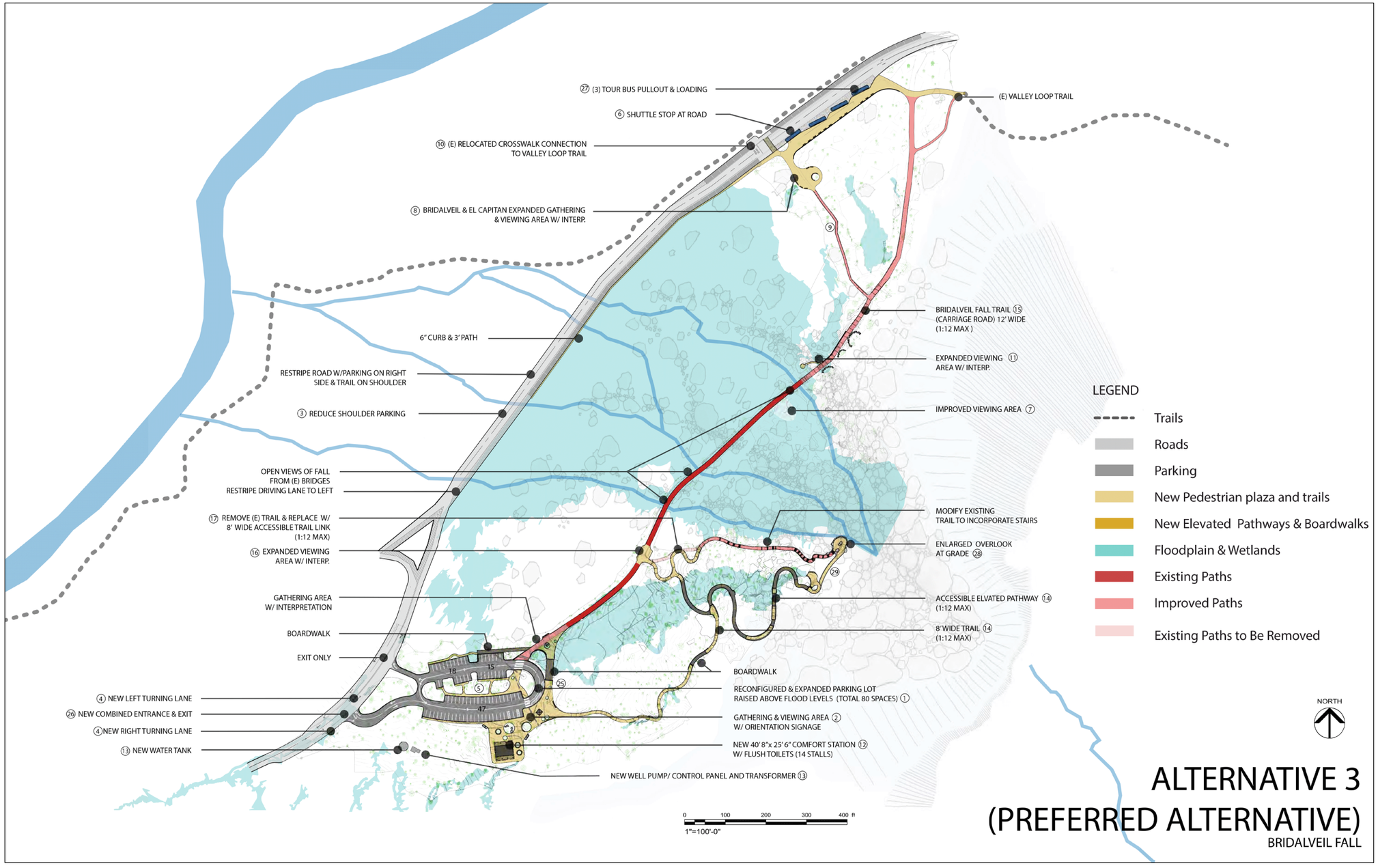


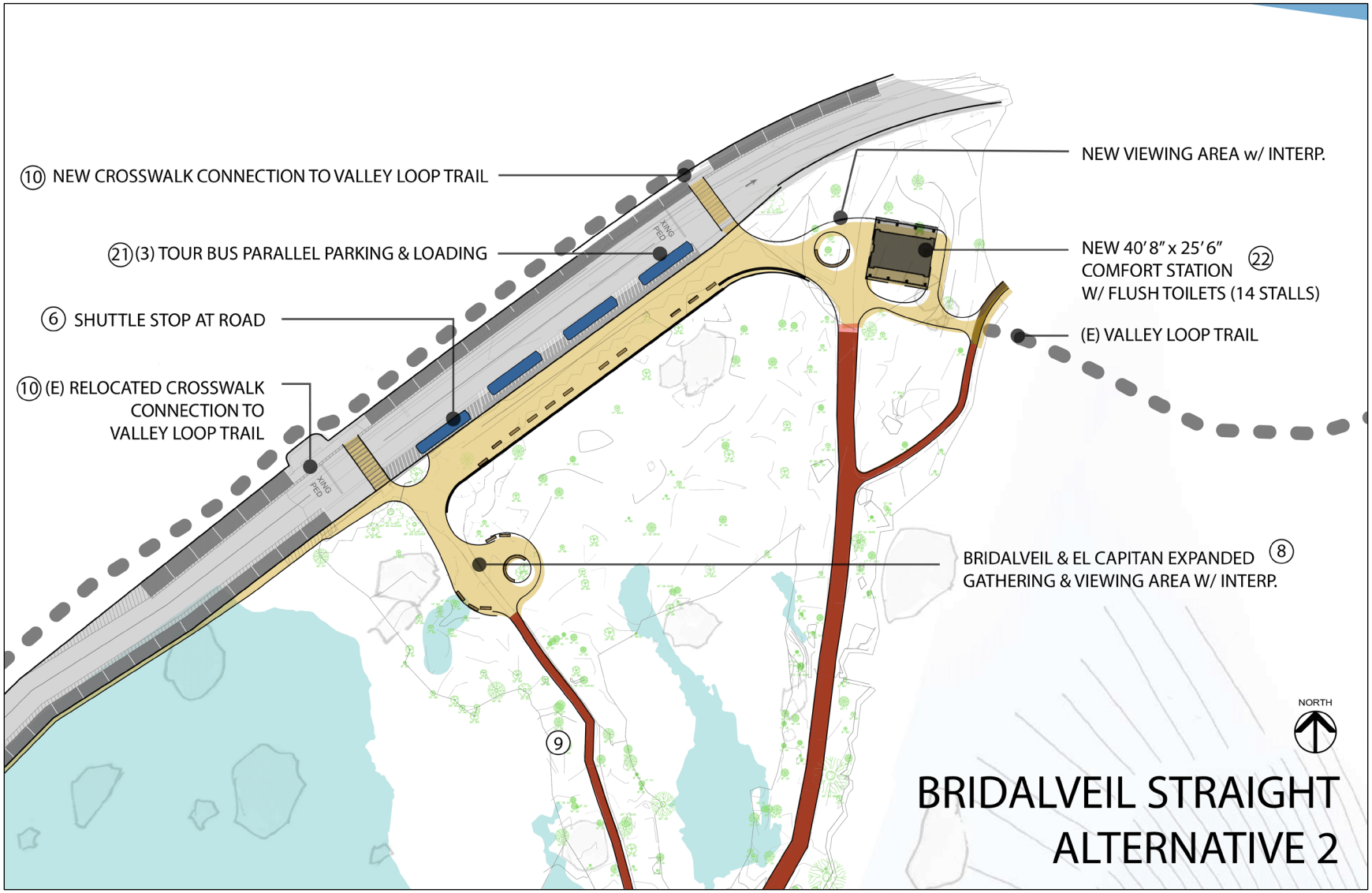
Note: Numbers on map correspond to numbers in Tables 2-2 and 2-3.

Figure 2-2. Alternative 2



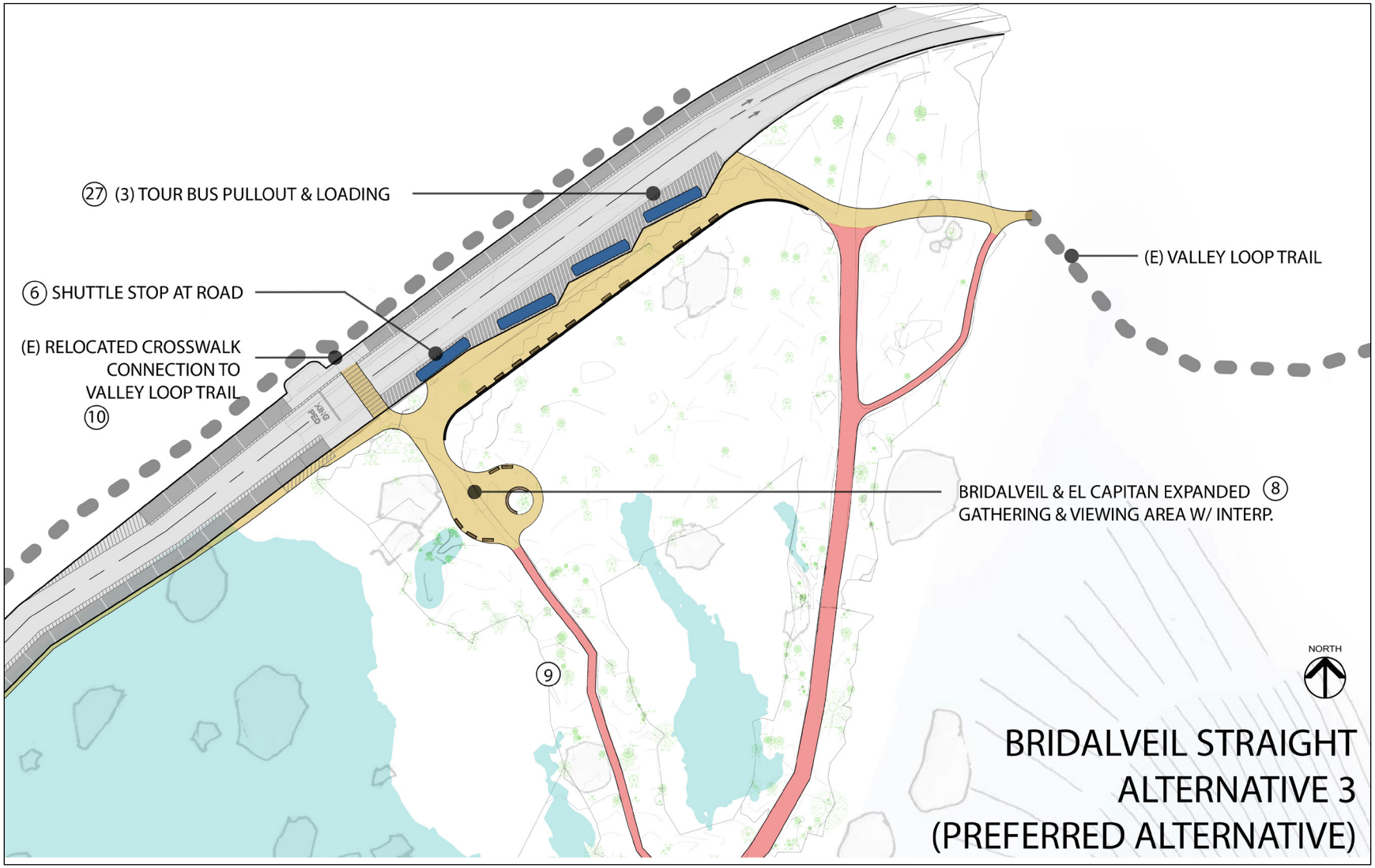
Note: Numbers on map correspond to numbers in Tables 2-2 and 2-3.

Figure 2-3. Alternative 3



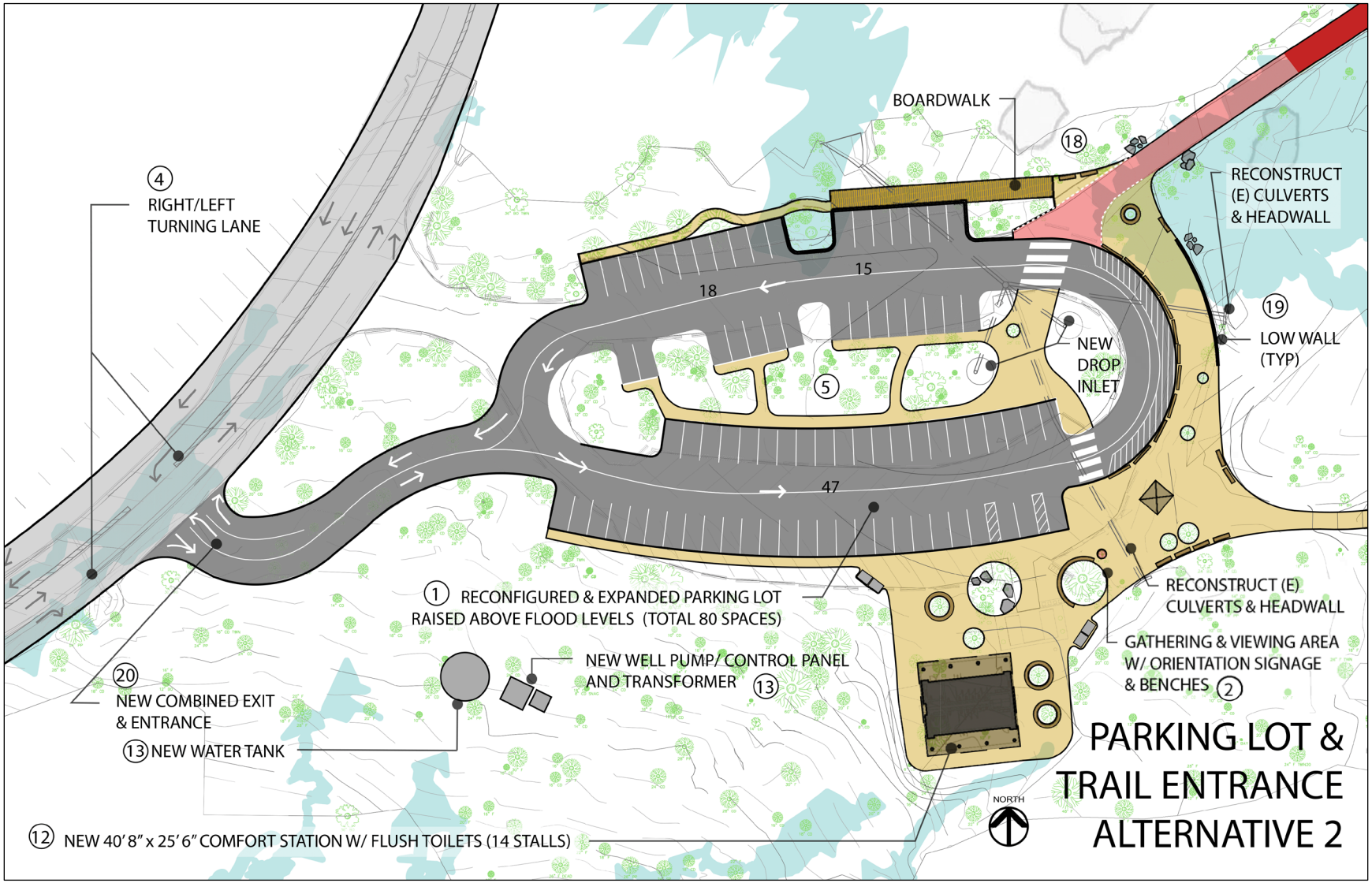
Note: Numbers on map correspond to numbers in Tables 2-2 and 2-3.

Figure 2-4. Bridalveil Straight Alternative 2



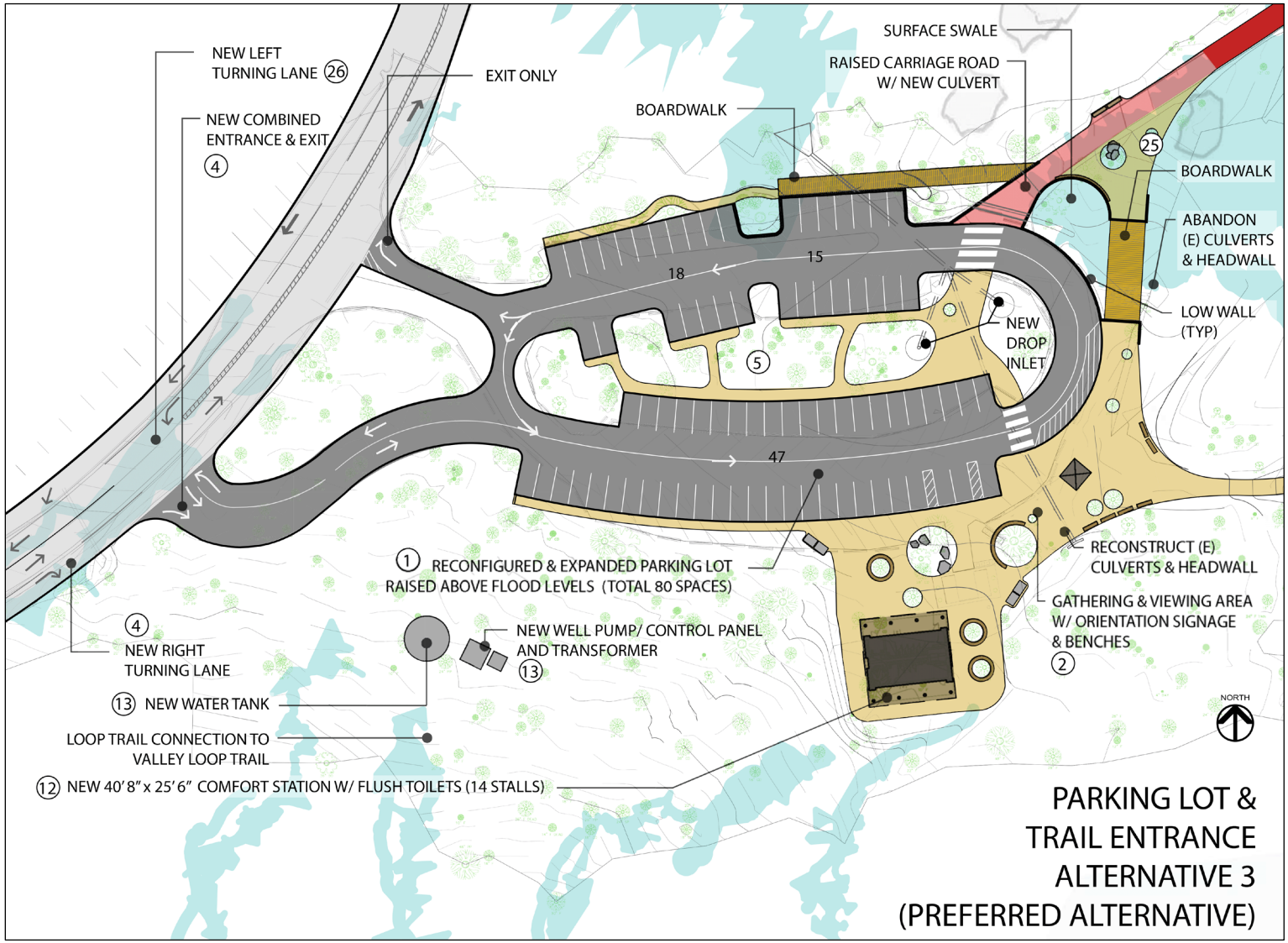
Note: Numbers on map correspond to numbers in Tables 2-2 and 2-3.

Figure 2-5. Bridalveil Straight Alternative 3



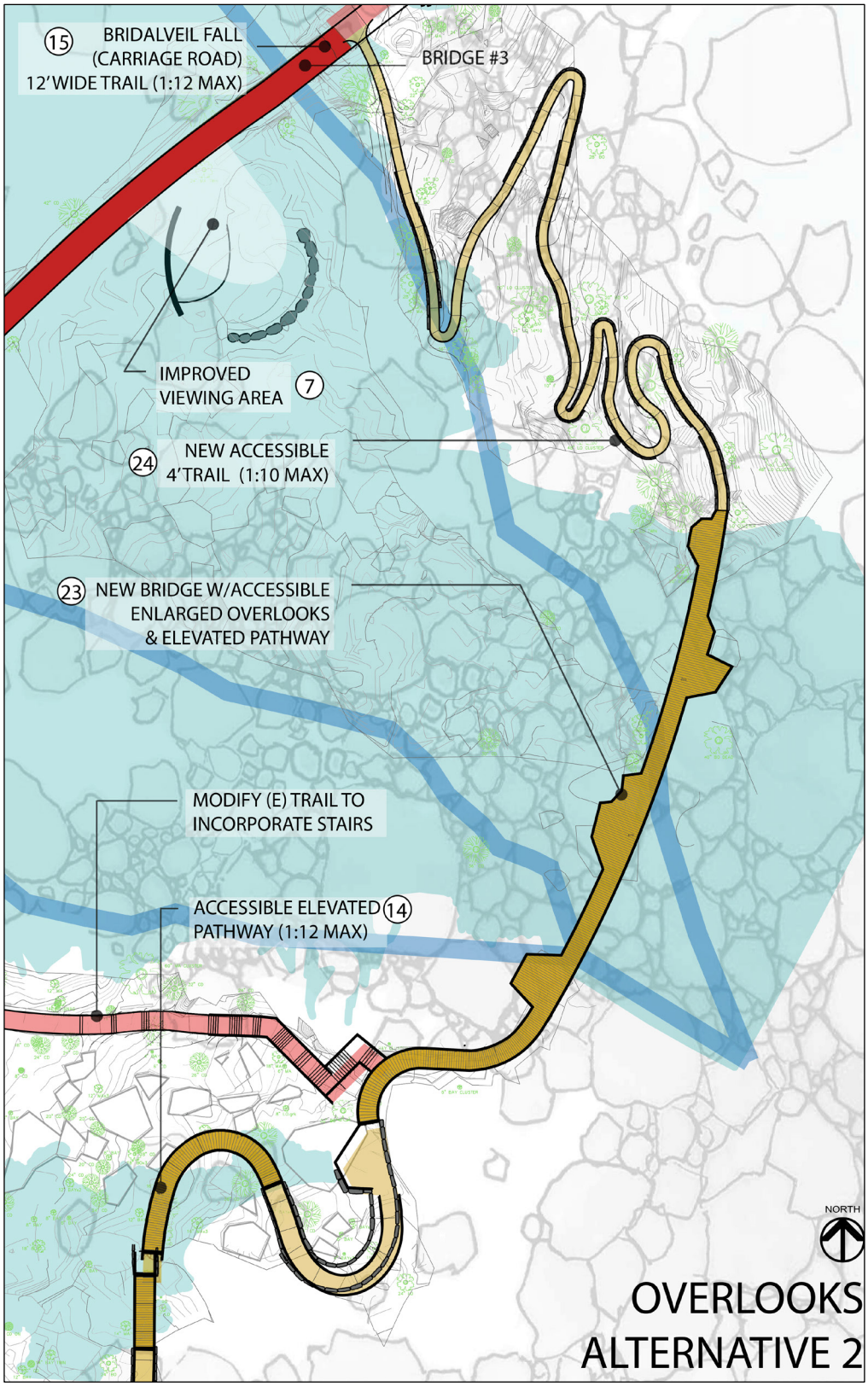
Note: Numbers on map correspond to numbers in Tables 2-2 and 2-3.

Figure 2-6. Parking Lot and Trail Entrance Alternative 2



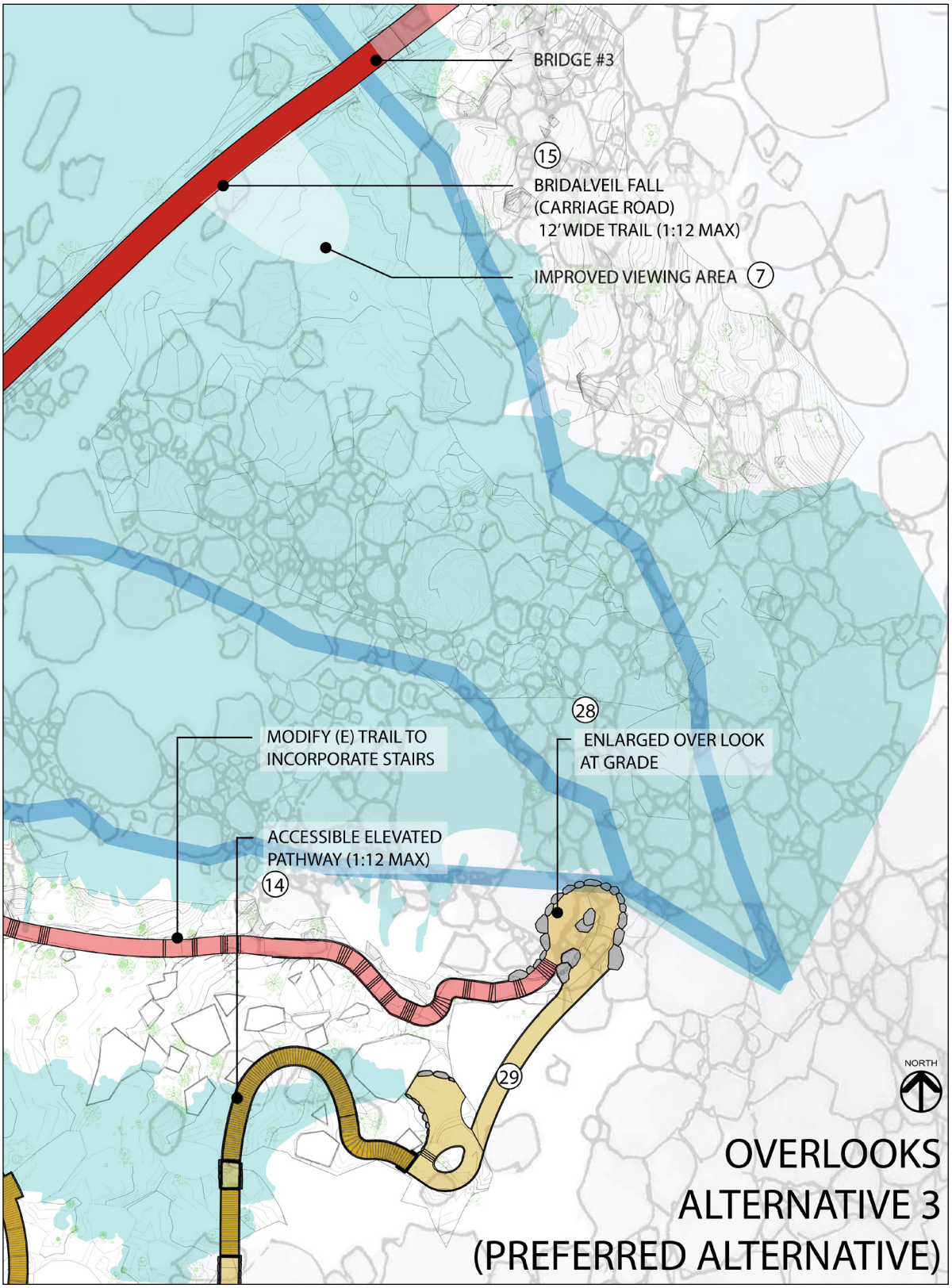
Note: Numbers on map correspond to numbers in Tables 2-2 and 2-3.

Figure 2-7. Parking Lot and Trail Entrance Alternative 3



Note: Numbers on map correspond to numbers in Tables 2-2 and 2-3.

Figure 2-8. Overlooks Alternative 2



Note: Numbers on map correspond to numbers in Tables 2-2 and 2-3.

Figure 2-9. Overlooks Alternative 3

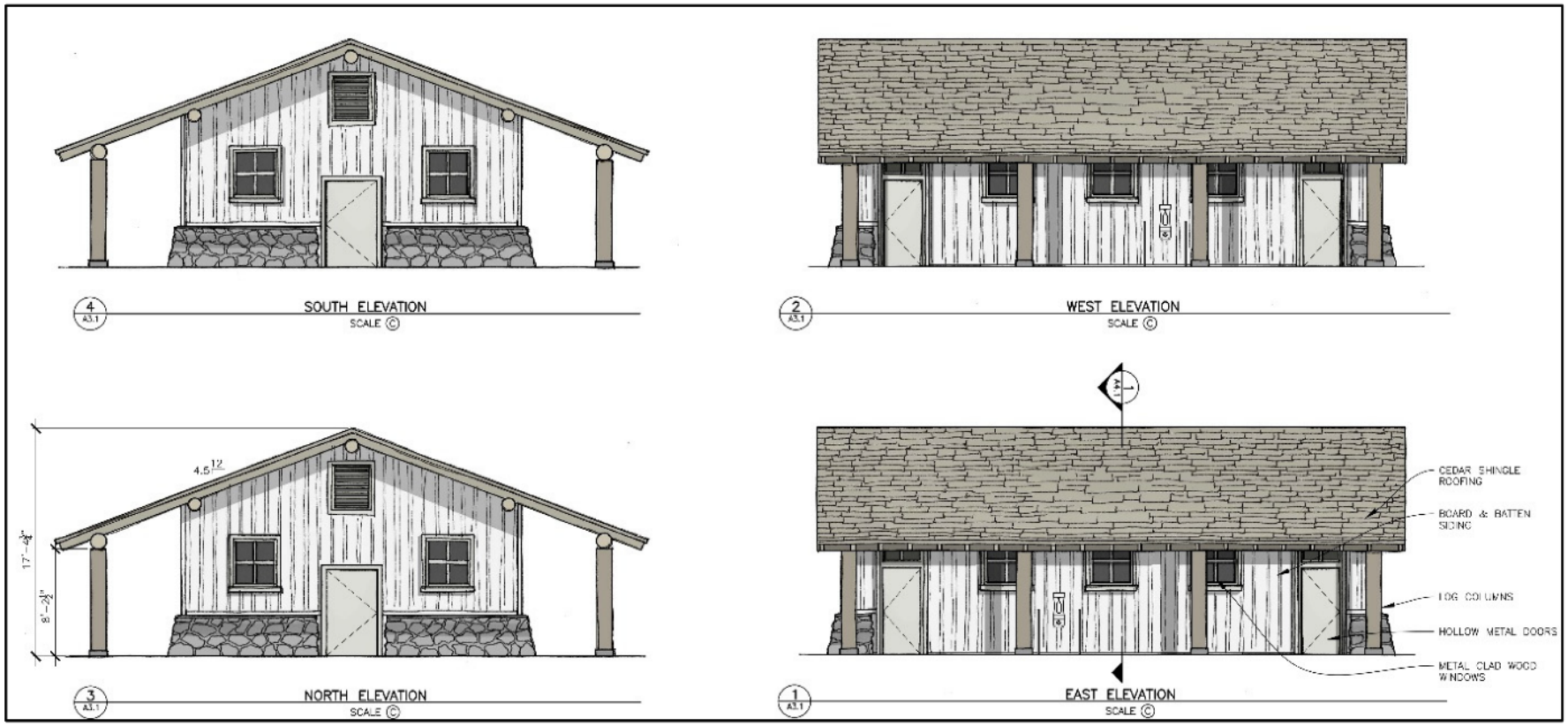


Figure 2-10. Illustration of Proposed Comfort Stations

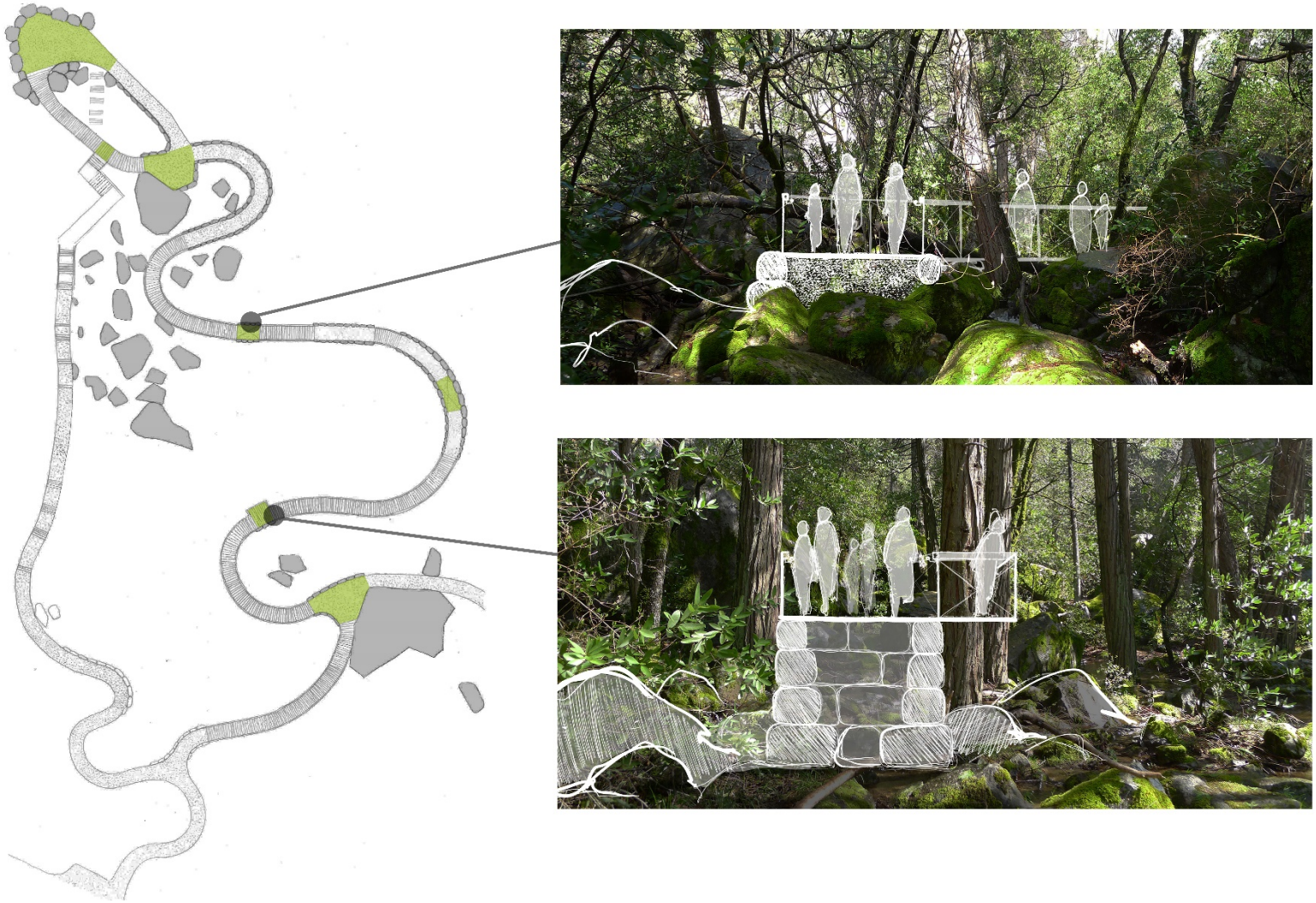


Figure 2-11. Elevated Pathway

MITIGATION MEASURES COMMON TO ALL ACTION ALTERNATIVES

The NPS places a strong emphasis on avoiding, minimizing, and mitigating potentially adverse environmental impacts. To protect natural resources and the quality of the visitor experience, the mitigation measures outlined in Appendix B would be implemented as part of each action alternative. The analysis of impacts for each alternative (Chapter 3) considers these mitigation measures as part of each alternative.

ALTERNATIVE 2 – BRIDALVEIL CREEK PEDESTRIAN BRIDGE

Alternative 2 includes construction of a new bridge across Bridalveil Creek from the existing viewing platform to a new trail on the east side of Bridalveil Creek (23). The alternative also includes construction of a comfort station at Bridalveil Straight (22), in addition to the *Actions Common to Alternatives 2 and 3* listed previously. Figure 2-2 displays the Alternative 2 project components.

Parking Lot and Entrance

Under Alternative 2, a new combined entrance and exit road to the parking lot would replace the existing entrance/exit road approximately 150 feet south of the existing entrance/exit (20). An island would be added to separate the exit and entrance lanes and there would be separate exit lanes for right-hand and left-hand turns.

The connection between the existing Bridalveil Fall Trail and the parking lot would be widened and raised with fill material to avoid areas that flood during high water periods (18). A different paving material would be used to delineate the historic alignment of the Bridalveil Fall Trail to the parking lot. The trailhead would be connected to the new gathering and viewing area at the parking lot with a sidewalk (19). The north end of the parking lot would also have a sidewalk and boardwalk leading to the existing trailhead.

Comfort Station

Under Alternative 2, a new 40-foot, 8-inch-long by 25-foot, 6-inch-wide building with flush toilets would be added at Bridalveil Straight (22) in addition to the new flush toilets at the parking lot described under *Actions Common to Alternatives 2 and 3*. There would be 14 stalls in each comfort station. Electrical and sewer lines for the new comfort station at Bridalveil Straight would run southwest along Southside Drive to the intersection with the Wawona Road and join the new lines from the proposed comfort station at the parking lot. These joined lines would connect to Northside Drive at Pohono Bridge. If trenching were used to install electrical and sewer lines, the ground disturbance from trenching would be approximately 3 feet wide and 4 feet deep. If directional drilling were used, the surface ground disturbance would only occur where the borer enters the ground at specific intervals along the route, while subsurface disturbance would occur where the lines are installed. Electrical and sewer lines would be placed within the existing road footprint. Manholes, approximately 8 feet deep and 5 feet wide, would be installed at regular intervals. A new well pump and control panel would be installed at Bridalveil Straight.

Bridalveil Straight

As described in *Actions Common to Alternatives 2 and 3*, a dedicated parking and loading area would be added on the south side of Southside Drive at Bridalveil Straight. Under Alternative 2, tour bus parking would be in a parallel configuration (see Figure 2-4) (21).

In addition to the gathering and viewing area described at Bridalveil Straight under *Actions Common to Alternatives 2 and 3*, a second gathering and viewing area, approximately 1,700 square feet in size, would be added east of the tour bus pullout and loading area, near the new comfort station (22).

Trails, Bridges, and Viewing Areas

Under Alternative 2, the park would construct a bridge from the existing viewing platform location across Bridalveil Creek to the east side of Bridalveil Creek (23). The bridge would expand in several places with accessible and enlarged overlooks. The entire bridge would serve as a viewing area spanning approximately 3,300 square feet. The west side of the bridge would connect to the existing trail that leads to the viewing platform, which would be widened to 8 feet. The east side of the bridge would connect to a new four-foot-wide trail that leads to the Bridalveil Fall Trail adjacent to Bridge 3 (24).

ALTERNATIVE 3 – EXPANDED VIEWING PLATFORM (PREFERRED ALTERNATIVE)

Alternative 3 would replace and expand the existing platform in its current location and construct an additional viewing platform on the new accessible loop trail, in addition to the *Actions Common to Alternatives 2 and 3* listed previously. Figure 2-3 displays the Alternative 3 project components.

Parking Lot and Entrance

Alternative 3 would create a separate entrance and exit road into the parking lot (26). The new entrance would be constructed southeast of the existing entrance off Wawona Road. The existing entry road would become an exit-only road.

The existing trailhead at the parking lot would be moved a short distance to minimize ponding during high water events. A short boardwalk on the east side of the parking lot would be constructed over the drainage area to connect with the new gathering and viewing area (25). The north end of the parking lot would connect to the existing trailhead with a sidewalk and boardwalk. Stones, or a similar material, would delineate the historic carriage road alignment and visually connect it with the new gathering and viewing area.

Comfort Station

Under Alternative 3, there would be no additional comfort station improvements beyond addition of a new comfort station at the parking lot as described under *Actions Common to Alternatives 2 and 3*.

Bridalveil Straight

As described in *Actions Common to Alternatives 2 and 3*, a dedicated parking and loading area would be added on the south side of Southside Drive at Bridalveil Straight. Under Alternative 3, tour bus parking would be slightly angled to allow buses to pull out without backing into the traffic lane (see Figure 2-5) (27).

Trails, Bridges, and Viewing Areas

Under Alternative 3, the existing viewing platform at the base of Bridalveil Fall would expand from 400 square feet to approximately 1,500 square feet (28). The viewing platform would be replaced and expanded in its current location. The new viewing platform would be constructed of robust materials suitable for the site conditions. The finished elevation of the new viewing platform surface would be between 4 inches and 18 inches above the existing viewing platform. A safety railing would be installed at the edge of the overlook. In addition to the new viewing platform that would be constructed on the new

accessible trail (Actions Common), a smaller platform would be added southwest of the existing platform (29) as funding permits.

The park would not construct a bridge across Bridalveil Creek under Alternative 3.

ALTERNATIVES CONSIDERED BUT DISMISSED

The NPS considered a range of actions when developing the alternatives for the rehabilitation of Bridalveil Fall. Table 2-1 lists the actions that the planning team analyzed, considered, and dismissed because they did not fully satisfy the objectives of this planning effort.

Table 2-1. Alternatives Considered but Dismissed

Action	Reasons for Dismissal
Allow buses to unload passengers at the parking lot and pick up passengers at Bridalveil Straight.	There would be no guarantee that bus parking would be available at Bridalveil Straight for passenger pick-up. Buses waiting for parking could create additional congestion and confusion along Bridalveil Straight.
Add vault toilets at Bridalveil Straight.	Vault toilets require consistent pumping and regular cleaning. Park staff must have specialized training to operate pumping equipment. The park does not have the operational capacity to add another vault toilet considering the intensive maintenance required to maintain vault toilets. This EA considers the addition of flush toilets at Bridalveil Straight, but not vault toilets, under Alternative 2.
Construct a leach field in the historic sewer plant location north of Bridalveil Fall, adjacent to the Merced River near its confluence with Bridalveil Creek. This new leach field could serve the new flush toilet at the parking lot and remove the need to construct lengthy sewer and power lines to connect to the existing system.	This option is inconsistent with the 2014 *Merced River Plan*, which calls for removal of the remains of the abandoned plant and restoration to natural conditions. The park abandoned and demolished the historic sewer plant in 1975 when the park constructed a new tertiary sewage treatment plant in El Portal. The park must protect and enhance the water quality of the Wild and Scenic Merced River. Construction of a new leach field in this area would likely require the park to amend the *Merced River Plan*. It is uncertain whether the park could obtain permits under the Clean Water Act to construct a leach field in close proximity to the Merced River. A new leach field would require the park to connect to a power source and construct additional infrastructure.
Construct a new trail and viewing platform from the Bridalveil Fall Trail near Bridge #3 toward the base of Bridalveil Fall.	The trail would be constructed within the bed-and-banks of Bridalveil Creek stream system. It would be subjected to high water velocities and high water depths during peak flows, creating the need for additional repair, maintenance, and debris clearing. The trail would be constructed into a relatively pristine area, with associated impacts to the natural habitat. The existing viewing platform would be visible from the new platform and hikers may hike cross-country from one to the other, creating new social trails in a relatively pristine area.
Remove the ability to make left hand turns out of the parking lot to decrease congestion.	If vehicles want to make a left turn, they would need to travel to Southside Drive and then make the one-way loop across El Capitan Crossover to Northside Drive and then back across Pohono Bridge. This is a considerable distance, it could take considerable time during congested periods of visitation, and the action could promote illegal U-turns on Wawona Road.

Table 2-1. Alternatives Considered but Dismissed

Action	Reasons for Dismissal
Move all parking to the right side of Bridalveil Straight and enhance views of El Capitan from the south side of the road. This would encourage visitors to stay on the south side of the road and improve safety in the area.	The vast majority of visitors stop along Bridalveil Straight for the breathtaking views of El Capitan (on the left side of the road). Visitors also stop for a number of other reasons including stretching their legs, checking maps, picnic lunches, river access. Keeping parking on the right side of the road may encourage some users to stay on the right side and not cross the street, but a substantial amount of visitors would be expected to cross the street.
Construct the proposed new loop trail from the parking lot to the viewing platform completely on-grade, without elevated portions of the trail. This design may be more compatible with other trails in the Yosemite Valley Historic District.	There is a 60-foot rise in elevation from the parking lot to the viewing platform. While it is possible to construct an accessible trail completely on grade using causeways to accommodate the rise of the trail, it would require extensive ground disturbance in sensitive areas to construct the causeways. Causeways would also restrict and confine natural wetland water flows in the lot, requiring flows to move through culverts in the causeways.
Significantly improve the Valley Loop Trail near Bridalveil Creek, on the north side of Southside Drive. Improvements to the trail in this area would allow year-round use rather than seasonal use during low-flow periods.	Improving the Valley Loop Trail near Bridalveil Creek has been a long-term goal of the park. Improvements would require the construction of several new bridges and extensive design with hydraulic modeling. The park intends to address this need as a separate project when additional funding and resources are available.
Require reservations for bus parking at Bridalveil Straight to help manage bus parking.	Both action alternatives accommodate parking for 3 tour buses and one shuttle bus at Bridalveil Straight. The park expects to enact tour bus reservations in other park locations in the future (see Cumulative Actions Appendix C). If needed, the park could expand bus reservations to the Bridalveil area at a later date, after the park implements the Bridalveil Fall project and evaluates the effectiveness of designated bus parking at Bridalveil Straight.

SUMMARY OF THE ALTERNATIVES

Tables 2-2 and 2-3 summarize the project components for Alternative 2 and Alternative 3.

Table 2-2. Summary of Actions Common to Alternatives 2 and 3

(Numbers in the table correspond to numbers on Figures 2-2 through 2-9)

Project Components	All Action Alternatives
Parking Lot	• The park would reconfigure the existing parking lot footprint to add 20-24 parking spaces for a total of about 80 spaces (including four accessible spaces). (1) • Regrade/raise the northeast east end of the parking lot to reduce flooding. (1) • Construct a plaza/gathering area with wayfinding and interpretation at the southeast corner of the parking lot. (2) • Add right-hand and left-hand turn lanes from Wawona Road into the parking lot. (4) • Add a formal trail from the north side to the south side of the parking lot through the island. (5) • Add bear boxes and additional animal-proof trash and recycling receptacles or dumpsters.

Table 2-2. Summary of Actions Common to Alternatives 2 and 3

(Numbers in the table correspond to numbers on Figures 2-2 through 2-9)

Project Components	All Action Alternatives
Vault Toilets at the Parking Lot	• Replace the existing four vault toilets at the parking lot with a new comfort station with flush toilets (14 fixtures). (12) • Install necessary infrastructure for the flush toilets (new sewer, electrical lines, transformer, well pump, control panel, water tank, and sewer lift station). (13) • Connect sewer and electrical lines to the main lines in Northside Drive. This will require approximately 1 mile of trenching or directional drilling in Wawona Road/Southside Drive up to Pohono Bridge, where the line will cross as part of the bridge (within the bridge deck).
Southside Drive at Bridalveil Straight	• Designate parking for one shuttle bus on the south side of Bridalveil Straight. (6) • Remove private vehicle parking, if necessary, to balance additional parking spaces proposed at the Bridalveil Fall Parking Lot. (3) • Construct a gathering and viewing area on the south side of Southside Drive. Selectively remove about 10 conifers to enhance views of El Capitan. Install benches and interpretive/wayfinding information. (8) • Formalize a trail from the gathering/viewing area to the Bridalveil Fall Trail with an accessibility acceptable hardened surface. (9) • Install one crosswalk in the center of Bridalveil Straight. (10)
Trails and Viewing Areas	• Add a new accessible loop trail from the parking lot to a viewing platform. The majority of the trail would be 8 to 10 feet wide, at-grade, and hardened with an accessibility acceptable surface. Portions of the trail would be elevated to reduce impacts to sensitive areas. (14) • Repair the Bridalveil Fall Trail from the third bridge to the east, where it meets the Valley Loop Trail with an accessibility acceptable hardened surface. (15) • Expand the intersection of the Bridalveil Fall Trail and trail to the existing viewing platform for interpretation and gathering. (16) • Rework the existing trail from the Bridalveil Fall Trail to the viewing platform. The trail will be a minimum of 8-feet wide with stairs as needed. Rework the stairs to meet code. (17) • Improve the viewing area to the northeast side of Bridge 3, adjacent to the Bridalveil Fall Trail (approximately 100 square feet in size) (11). • Improve and delineate the access to the viewing area at the southwest side of Bridge 3 (760 square feet). Improvements would be minor – no blasting, rock removal, or heavy grading. (7) • Add wayfinding and interpretive signage throughout the project area. • Remove small conifer trees (<20 inches dbh) from within the dripline of selected mature California black oaks to improve oak habitat (<40 small trees).
Accessibility	• Ensure that all new trails and pathways are accessible.

Table 2-3. Summary of Actions that vary Among the Action Alternatives

(Numbers in the table correspond to numbers on the Alternative Figures 2-2 through 2-9)

Project Components	Alternative 2 Bridalveil Creek Pedestrian Bridge	Alternative 3 Expanded Viewing Platform/Loop Trail
Parking Lot	• Widen the connection between the trailhead and parking lot. Bring in fill and install a culvert to direct water under the walkway. (18) • Connect the trailhead to the visitor plaza with a sidewalk. (19)	• Move the trailhead a short distance from the parking lot (to avoid high water) and build short boardwalks to connect the trailhead with plaza to the south and parking lot to the east. (25) • Delineate the historical alignment of the Carriage Road (Bridalveil Fall Trail) as it continues to the parking lot with stones or other materials to retain a visual connection to the historic landscape.
Parking Lot Entrance	• Construct a new combined entrance and exit to the parking lot that is farther south and has separate exit lanes for right-hand and left-hand turns. (20)	• Construct an additional entrance into the parking lot so that there is a single entry and single exit. (26)
Southside Drive at Bridalveil Straight	• Parallel park three tour buses along the south side of road. (21) • Add a second flush toilet and small interpretive plaza to the east end of Bridalveil Straight. (22)	• Install slightly angled parking for three tour buses on the south side of road. (27)
Trails and Viewing Areas	• Construct a bridge/viewing platform that runs across Bridalveil Creek from the existing viewing platform to the east side of the creek (approximately 3,300 square feet in total). (23) • Construct a 4-foot-wide accessible trail along east side of Bridalveil Creek between the east end of the bridge and the Bridalveil Fall Trail. (24)	• Expand the existing viewing platform from 400 square feet to 1,500 square feet. Install safety railing. (28) • Create an accessible loop trail with views of the fall.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The two action alternatives presented in this document represent a reasonable range of options for rehabilitation of Bridalveil Fall. Table 2-4 provides a summary comparison of the potential impacts associated with the No Action Alternative and the two action alternatives, based on the environmental analysis provided in Chapter 3.

Table 2-4. Summary Comparison of Impacts for the No Action and Action Alternatives

Alternative 1 No Action Alternative	Alternative 2 Bridalveil Creek Pedestrian Bridge	Alternative 3 Expanded Viewing Platform
Hydrology, Floodplains, and Water Quality		
• There would be no new impacts to hydrology, floodplains, and water quality. • The parking lot would continue to flood. • There would be continued erosion and subsequent sediment discharge in proximity of the parking lot. • There would continue to be high levels of human waste in natural areas.	• There would be intensive short-term construction-related effects within the bed and banks of Bridalveil Creek associated with bridge construction. Effects may include discharge of sediment and other pollutants. Standard BMPs would partially mitigate the adverse effects. • The new flush toilet would reduce levels of human waste in natural areas near the parking lot and Southside Drive. • Additional trails and viewing areas would reduce informal trailing in natural areas, with the exception of the east trail between the bridge and the Bridalveil Fall trail. • The raised parking lot and design of the trailhead would reduce flooding in the parking lot. • There may be permanent effects to streamflow dynamics during peak flows associated with the bridge across Bridalveil Creek. Design requires site-specific engineering to minimize interference with runoff or additional flooding. • High water flood events could overtop bridge and result in damage to the bridge.	• The new flush toilet would reduce levels of human waste in natural areas near the parking lot. • The additional loop trail and viewing areas would reduce informal trailing in natural areas. • The raised parking lot and design of the trailhead would reduce flooding in the parking lot.

Table 2-4. Summary Comparison of Impacts for the No Action and Action Alternatives

Alternative 1 No Action Alternative	Alternative 2 Bridalveil Creek Pedestrian Bridge	Alternative 3 Expanded Viewing Platform
Wildlife		
• There would be no new impacts to wildlife. Informal trailing that fragments wildlife habitat would continue.	• During construction, the use of equipment, disturbance of habitat, work within wetland and riparian areas, tree removal activities, and the generation of noise would cause widespread, short-term adverse impacts to wildlife. These impacts would be partially mitigated by implementing standard BMPs and mitigation measures (i.e., pre-construction wildlife surveys, avoidance of nests and roosts, clear delineation of work and staging areas, monitoring when necessary, and restoration of disturbed areas). • Additional trails and viewing areas would reduce informal trailing in wildlife habitat. However, the new trail on the east side of the creek may increase informal trailing.	• During construction, the use of equipment, disturbance of habitat, work within wetland and riparian areas, tree removal activities, and the generation of noise would cause local, short-term adverse impacts to wildlife. These impacts would be partially mitigated by implementing standard BMPs and mitigation measures (i.e., pre-construction wildlife surveys, avoidance of nests and roosts, clear delineation of work and staging areas, monitoring when necessary, and restoration of disturbed areas).
Vegetation		
• There would be no new impacts to vegetation. • Informal trailing that denudes vegetation would continue.	• Construction activities would result in permanent loss of 1.75 acres of vegetation at the new accessible loop trail from the parking lot and the new east trail along Bridalveil Creek that would traverse between the eastern bridge abutment and the Bridalveil Fall Trail. • There would be a direct permanent loss of vegetation for vista clearing (less than 100 trees). • Additional trails and viewing areas would reduce informal trailing. However, the new trail on the east side of the creek may increase informal trailing. • Conifers cut from within the driplines of California black oaks for habitat improvement would enhance the health of mature oaks. • Construction activities could increase the potential for the spread of invasive species.	• Construction activities would result in permanent loss of 1.38 acres vegetation at the new accessible loop trail from the parking lot. • There would be a direct permanent loss of vegetation for vista clearing (less than 100 trees). • The additional loop trail and viewing areas would reduce informal trailing in natural areas. • Conifers cut from within the driplines of California black oaks for habitat improvement would enhance the health of mature oaks. • Construction activities could increase the potential for the spread of invasive species.

Table 2-4. Summary Comparison of Impacts for the No Action and Action Alternatives

Alternative 1 No Action Alternative	Alternative 2 Bridalveil Creek Pedestrian Bridge	Alternative 3 Expanded Viewing Platform
Wetlands		
• There would be no new impacts to wetlands. Existing impacts would continue, including erosion and subsequent sediment discharge. • Informal trailing that fragments wetland habitat, alters wetland hydrology, and denudes vegetation would continue.	• Construction activities may result in a direct loss of wetlands from grade and/or fill activities near piers to support new trails and near bridge abutments. • Short-term adverse impacts, including trampling, increased sedimentation, and other temporary impacts to wetlands may occur from construction related activities in the project area. Mitigation measures and BMPs (i.e., fencing of construction areas, trench plugs, stabilization mats, etc.) would minimize these impacts. • Additional trails and viewing areas in the vicinity of the accessible trail to the existing viewing platform would reduce informal trailing and impacts to wetlands such as waste disposal.	• Construction activities may result in a direct loss of wetlands from grade and/or fill activities near piers to support new trails. • Short-term adverse impacts, including trampling, increased sedimentation, and other temporary impacts to wetlands may occur from construction related activities in the project area. Mitigation measures and BMPs (i.e., fencing of construction areas, trench plugs, stabilization mats, etc.) would minimize these impacts. • Additional trails and viewing areas in the vicinity of the accessible trail to the existing viewing platform would reduce informal trailing and impacts to wetlands such as waste disposal.
Scenic Resources		
• There would be no new impacts to scenic resources. • The park would continue to maintain the six scenic views of Bridalveil Fall identified in the *Merced River Plan*, including two historic views.	• There would be short-term impacts on scenic resources including visually intrusive light and heavy construction vehicles, equipment, materials, personnel, and construction staging areas visible in the visitor use areas. • The addition of multiple viewing areas and trails as well as selective tree removal would improve existing views of Bridalveil Fall and increase viewing opportunities for visitors. • There would be opportunities for dramatic views from the new bridge. • Two new structures would be introduced into the native landscape – a comfort station along Bridalveil Straight and a new pedestrian bridge across Bridalveil Creek.	• There would be short-term impacts on scenic resources including visually intrusive light and heavy construction vehicles, equipment, materials, personnel, and construction staging areas visible in the visitor use areas. • The addition of multiple viewing areas and trails as well as selective tree removal would improve existing views of Bridalveil Fall and increase viewing opportunities for visitors. • The existing viewing platform at the base of Bridalveil Fall would be increased in size.

Table 2-4. Summary Comparison of Impacts for the No Action and Action Alternatives

Alternative 1 No Action Alternative	Alternative 2 Bridalveil Creek Pedestrian Bridge	Alternative 3 Expanded Viewing Platform
Soils and Geology		
• No new impacts to soils and geology would occur. • Current operation related impacts would include continued soil erosion and compaction on unpaved trails and potential exposure to rockfall.	• There would be short-term construction-related impacts to approximately 4.23 acres of soils including soil compaction, soil erosion, and soil contamination, and displacement of soil and boulders. These effects would be minimized by following standard mitigation measures and BMPs (i.e. structural and stabilization practices to minimize erosion and runoff, etc.). • Approximately 1.75 acres of new impervious surfaces would be installed. • Additional trails and viewing areas in the vicinity of the accessible trail to the existing viewing platform would reduce informal trailing, soil erosion, and soil compaction, resulting in long-term beneficial impacts.	• There would be short-term construction-related impacts to approximately 3.75 acres of soils including soil compaction, soil erosion, and soil contamination, and displacement of soil and boulders. These effects would be minimized by following standard mitigation measures and BMPs (i.e. structural and stabilization practices to minimize erosion and runoff, etc.). • Approximately 1.38 acres of new impervious surfaces would be installed. • Additional trails and viewing areas in the vicinity of the accessible trail to the existing viewing platform would reduce informal trailing, soil erosion, and soil compaction, resulting in long-term beneficial impacts.
Visitor Experience and Recreation		
• No new impacts to visitor experience and recreation would occur. • Visitors would continue to experience low-functioning vault toilets, congestion associated with the parking lot, busy trails, crowded viewing platform, a lack of accessible path of travel to the primary viewing platform, and unclear wayfinding.	• There would be a short-term impact on visitor experience during the construction period due to noise from the construction, increased traffic from construction personnel, and limited access to construction areas. • Restroom facilities at the parking lot and along Southside Drive would be improved. • Crowding on the trails and the viewing platform would be reduced. • Safety and congestion in and around the parking lot, existing viewing area, and along Southside Drive would be improved. • Interpretation, wayfinding, and accessibility would be improved.	• There would be a short-term impact on visitor experience during the construction period due to noise from the construction, increased traffic from construction personnel, and limited access to construction areas. • Visitor services at the parking lot would be improved. • Crowding on the trails and the viewing platform would be reduced. • Safety and congestion in and around the parking lot, existing viewing area, and along Southside Drive would be improved. • Interpretation, wayfinding, and accessibility would be improved.

Table 2-4. Summary Comparison of Impacts for the No Action and Action Alternatives

Alternative 1 No Action Alternative	Alternative 2 Bridalveil Creek Pedestrian Bridge	Alternative 3 Expanded Viewing Platform
Park Operations and Facilities		
• No new impacts to park operations and facilities would occur. • Low-functioning vault toilets would continue to require frequent pumping by staff, as well as cleaning. • Traffic management would continue to be required at the parking lot entrance during peak visitation. • Maintenance and repair needs would likely increase with continued visitation and aging infrastructure.	• Maintenance time and effort at the parking lot toilets would decrease dramatically as flush toilets do not require pumping, just cleaning. • Safety railings may reduce off-trail hiking toward the falls and may reduce the need for search and rescue operations. • Additional time and effort would be required to maintain the 2nd toilet at Southside Drive. • There would be substantial additional staff time and funding required to regularly maintain and repair bridge and clear woody debris from bridge abutments. • Additional ranger patrols may be required to patrol and close the bridge when conditions are unsafe. • There would be additional staff time required to maintain and repair new loop trail. • Traffic management would continue to be required at the parking lot entrance during peak visitation.	• Maintenance time and effort at the parking lot toilets would decrease dramatically as flush toilets do not require pumping, just cleaning. • Safety railings may reduce off-trail hiking toward the falls and may reduce the need for search and rescue operations. • There would be additional staff time required to maintain and repair the new loop trail and the new trail heading from Bridge 3 toward the Falls. • Traffic management would continue to be required at the parking lot entrance during peak visitation.

Table 2-4. Summary Comparison of Impacts for the No Action and Action Alternatives

Alternative 1 No Action Alternative	Alternative 2 Bridalveil Creek Pedestrian Bridge	Alternative 3 Expanded Viewing Platform
Cultural Resources – Built Environment (Historic Structures and Landscapes)		
• No new impacts to cultural resources would occur. • Existing use of area would continue to allow increased degradation of archeological sites and areas of cultural sensitivity due to off-trail use. • Existing historic structures and features in the Bridalveil Fall area would remain largely the same as their existing state, and receive the required level of maintenance and upkeep to retain their integrity. • Significant views and vistas in the area of potential effect would remain the same, as selective tree and vegetation removal outside that prescribed in the *Merced River Plan*, would not occur. • No adverse effect on the Yosemite Valley Historic District would occur.	• Pending final design to ensure compatibility with the Yosemite Design Guidelines (NPS 2011a), and determination of no adverse effect to historic properties that are contributing to the Yosemite Valley Historic District, Yosemite Valley Archeological District, as well as known properties of cultural, traditional, and religious significance to Yosemite's consulting tribes and groups, there would be no adverse effect on the Yosemite Valley Historic District. • Selective tree and vegetation removal would restore historic vistas and improve existing views of Bridalveil Fall. This would result in a beneficial impact on the Yosemite Valley Historic District. • Additional trails and viewing areas in the vicinity of the accessible trail to the existing viewing platform would reduce informal trailing, resulting in long-term beneficial impacts.	• Pending final design to ensure compatibility with the Yosemite Design Guidelines (NPS 2011a), and determination of no-adverse effect to historic properties that are contributing to the Yosemite Valley Historic District, Yosemite Valley Archeological District, as well as known properties of cultural, traditional, and religious significance to Yosemite's consulting tribes and groups, there would be no adverse effect on the Yosemite Valley Historic District. • Selective tree and vegetation removal would restore historic vistas and improve existing views of Bridalveil Fall. This would result in a beneficial impact on the Yosemite Valley Historic District. • Additional trails and viewing areas in the vicinity of the accessible trail to the existing viewing platform would reduce informal trailing, resulting in long-term beneficial impacts.
Cultural Resources – Archeological and Ethnographic Resources		
• No new impacts to cultural resources would occur. • No adverse effect on the Yosemite Valley Historic District would occur.	• Pending concurrence with the SHPO and tribes, there would be no adverse effect on the Yosemite Valley Archeological District or ethnographic resources, with mitigation and avoidance measures in place.	• Pending concurrence with the SHPO and tribes, there would be no adverse effect on the Yosemite Valley Archeological District or ethnographic resources, with mitigation and avoidance measures in place.

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

BACKGROUND

This chapter describes the existing environment associated with the alternatives in this EA. It also describes the direct, indirect, and cumulative impacts that could result from implementation of the alternatives. A summary of the environmental consequences of each alternative is located in Chapter 2, Table 2-4.

This chapter organizes information under 11 resource topics. Resource topics dismissed from further analysis and the rationale for their dismissal follows the list of resource topics considered. The general methodology for determining impacts is found after the list of resource topics.

Resource Topics Considered

- Natural Resources
  - Hydrology, Floodplains, and Water Quality
  - Wildlife (including special status species)
  - Vegetation (including special status species)
  - Wetlands
  - Scenic Resources
  - Soils and Geology
- Cultural Resources
  - Built Environment
  - Archeological Resources
  - Ethnographic Resources
- Sociocultural Resources
  - Visitor Experience and Recreation (including transportation and capacity issues)
  - Park Operations and Facilities

Resource Topics Dismissed from Further Analysis

The following resources are not expected to be affected or may be negligibly affected by implementation of the alternatives.

Air Quality - Implementation of any of the action alternatives would result in short-term impacts from emissions generated from construction equipment. However, the overall impacts on air quality would be short-term and negligible. There would be no long-term impacts on air quality from implementation of this project. Therefore, this topic has been dismissed from further analysis in this document.

Energy Consumption - Overall energy consumption within the park would not be influenced by the alternatives.

Environmental Justice – Presidential Executive Order 12898, *General Actions to Address Environmental Justice in Minority Populations*, requires all federal agencies to identify and address the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. According to the U.S. Environmental Protection Agency (USEPA), environmental justice is the

> …fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people,

> including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies (USEPA 1998).

Park staff and planning team members actively solicited public participation as part of the planning process and gave equal consideration to all input from persons regardless of age, race, income status, or other socioeconomic or demographic factors. Environmental justice is dismissed as an impact topic for the following reasons:

- The impacts associated with implementation of the preferred alternative would not disproportionately affect any minority or low-income population or community.
- Implementation of the preferred alternative would not result in any identified effects that would be specific to any minority or low-income community. Restrictions on travel or access to any area of the park that might result from the project would be equally applied to all visitors, regardless of race or socioeconomic standing.
- The action alternatives would not result in destruction or disruption of community cohesion and economic vitality, displacement of public and private facilities and services, increased traffic congestion, and/or exclusion or separation of minority or low-income populations from the broader community.

Indian Trust Resources - Indian Trust Resources are legal obligations of the U.S. Government to protect tribal lands, assets, resources, and/or treaty rights as granted under treaty or other legal instrument. No trust treaties exist within Yosemite. The consideration of Indian Trust Resources (as specified in Director's Order 12, Secretary's Order 3175, and other policies/regulations) do not apply to the Bridalveil Fall Rehabilitation project or any project within Yosemite.

Land Use - Yosemite National Park classifies land uses within the park as "Parklands" regardless of the individual types of land uses within the park. Implementation of the Bridalveil Fall Rehabilitation Project would not affect this classification, or any land uses within the park.

Museum Collections - Park projects can indirectly affect the museum collections by generating additions to the collections from archeological data recovery performed as mitigation for direct site impacts. To the maximum extent feasible, impacts to archeological resources would be avoided. Based on the alternatives developed for analysis, data recovery is unlikely to be necessary.

Night Sky - No aspect of the alternatives would have an impact on night sky.

Prime and Unique Farmlands - There are no agricultural lands within Yosemite National Park. No alternative in this EA would have direct or indirect effects on downstream agricultural lands.

Public Health and Safety - Public health and safety is a fundamental element of the purpose and need for the Bridalveil Fall Rehabilitation Project. As such, it is analyzed under the following topics, rather than as one separate topic: Visitor Experience (which considers visitor safety) and Park Operations (which considers employee safety).

Socioeconomics (including growth inducing impacts per the California Environmental Quality Act [CEQA]) **-** There would be no measureable changes expected in park-wide annual visitation (estimated at over five million people in 2016) as a result of the Bridalveil Fall Area Rehabilitation Project. The project would accommodate current visitor use levels in west Yosemite Valley as directed in the *Merced River Plan*. Yosemite visitors spent over $381 million measured in 2010 dollars, per Money Generation Model 2 (MGM2) models. This is a measure of the most directly observable socioeconomic impact visitors have on the region before estimating multiplier effects. Visitor spending generates over 5,300 jobs and over a quarter billion dollars in value added to the four-county Yosemite region. Value added is technically the sum of labor income, profits and rents,

and indirect business taxes, and serves as the best overall measure of the total socioeconomic importance of visitor spending within the region. The project would have no anticipated effect on regional income and jobs would not be lost or shifted. Overall, the project is expected to result in negligible impacts on the socioeconomic environment, visitor populations, and the regional economy. Similarly, the project is not expected to result in growth-inducing impacts for the region or in nearby communities. Therefore, socioeconomics is dismissed from further analysis.

Soundscape - No aspect of the alternatives would have a long-term impact on the natural soundscapes. Construction would be phased during 2018 and 2019. During construction, workers would ensure that all construction equipment has functional exhaust muffler systems; use hydraulically or electrically powered construction equipment when feasible; locate stationary noise sources as far from sensitive receptors as possible; limit the idling of motors except as necessary (e.g., concrete mixing trucks); and develop a construction schedule that minimizes impacts to adjacent noise-sensitive activities. The contractor would submit a work plan/schedule that specifies measures that would minimize construction-related noise in noise-sensitive areas and any additional protective measures they would enact (Appendix B). These measures are expected to limit short-term noise-related impacts under both action alternatives; therefore, Soundscapes is dismissed from further analysis.

GENERAL METHODOLOGY FOR ESTABLISHING IMPACTS

The environmental consequences analysis describes direct and indirect impacts, and their significance for each alternative. The analysis is based on the assumption that the mitigation measures identified in the *Mitigation Measures Common to All Action Alternatives* section of Chapter 2 (and Appendix B) would be implemented in concert with each action alternative. Potential impacts are described in terms of context, duration, and type. General impact significance determination definitions are described below.

Context. The context of an impact considers where impacts would occur and whether they would be site-specific (within the project area), local (beyond the project area within Yosemite National Park), regional (Sierra Nevada), or broader.

Duration. The duration of an impact considers the length of time an effect would last, either short-term or long-term:

- Short-term is generally used for impacts lasting only for the project duration, generally 1 year from the implementation date.
- Long-term impacts occur beyond the date a project is considered fully implemented.

Type. Type describes impacts as beneficial or adverse:

- Beneficial impacts result in a positive change in the condition or appearance of a resource or a change that moves a resource toward a desired condition.
- Adverse impacts are changes that move a resource away from a desired condition or detracts from its appearance or condition.

CUMULATIVE IMPACTS

The CEQ defines a cumulative impact as follows (40 Code of Federal Regulations [CFR] 1508.7):

> *A "cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions.*

> *Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

The cumulative impacts analysis evaluates impacts in terms of the specific resources, ecosystem, and human community affected and focuses on impacts that are truly meaningful (CEQ Handbook 1997). Cumulative projects considered in this analysis include past and present actions and planning development activity currently being implemented or planned for implementation in the reasonably foreseeable future. The cumulative analysis evaluates the impacts of each alternative in conjunction with other past, present, and reasonably foreseeable actions that would result in beneficial or adverse additive effects on a resource. A summary of cumulative projects is included in Appendix C.

HYDROLOGY, FLOODPLAINS, AND WATER QUALITY

Affected Environment

Hydrology. The Bridalveil Falls project area is located within the Merced River basin, which is part of the San Joaquin River Hydrologic Area. The Merced River begins at the crest of the Sierra Nevada and is joined by several tributaries, including Bridalveil Creek, as it drains westward toward the Central Valley before joining the San Joaquin River. In areas of the Merced River basin above 5,000 feet, precipitation generally falls as snow between the months of November and April. Peak stream flows, as a result of snowmelt, occur in May and June. In September and October, the river is at minimum flow.

Bridalveil Creek forms the core of the project area as it flows northwest from the base of Bridalveil Fall. At the base of the fall, Bridalveil Creek forms multiple braided stream channels as it descends a steep debris flow fan. The gradient of Bridalveil Creek decreases as it reaches the edge of the project area at Northside Drive. The project area does not include the confluence of Bridalveil Creek with the Merced River, which is approximately 600 feet downstream of the project area boundary.

The stream system includes active low-flow channels, floodplain, and high-flow channels (Figure 3-1). Apart from the perennial Bridalveil Creek, multiple intermittent and ephemeral channels exist in the project area. These channels originate from the walls of Yosemite Valley or high water flows in Bridalveil Creek. Flows in the project area generally peak during the spring snowmelt, although some intermittent and ephemeral channels may only have flow during heavy rain events (NPS 2017a).

The parking area, a historic carriage road, and trails lead from outlying areas to a waterfall viewing platform. This local infrastructure, along with culverts and bridges, diverts some stream channels. One culvert directs flow from an intermittent channel either under or directly adjacent to the current parking lot (NPS 2017a).

Floodplains. Since 1916, Yosemite National Park has experienced 11 winter floods large enough to cause damage to property. The northernmost tip of the Bridalveil Fall project area is located within the 100-year floodplain associated with the Merced River floodplain (Figure 3-1). The Bridalveil Creek stream system in the project area is bounded by a 2- to 10-year active floodplain (Figure 3-1). For the purposes of this document, the NPS assumes that current and proposed facilities are located in the 100-year floodplain, per NPS Procedural Manual 77-2: *Floodplain Management* (update 2004).

Executive Order 11988, *Floodplain Management*; Director's Order 77-2: *Floodplain Management*; and the NPS Procedural Manual 77-2: *Floodplain Management* require the NPS to protect floodplain values and minimize flood risks. The NPS Procedural Manual requires that parks develop a Statement of Findings to: (1) provide an understanding of risks to human health and safety, (2) analyze risks to property, and (3) describe the effects of the proposed action on floodplain values (Appendix D).

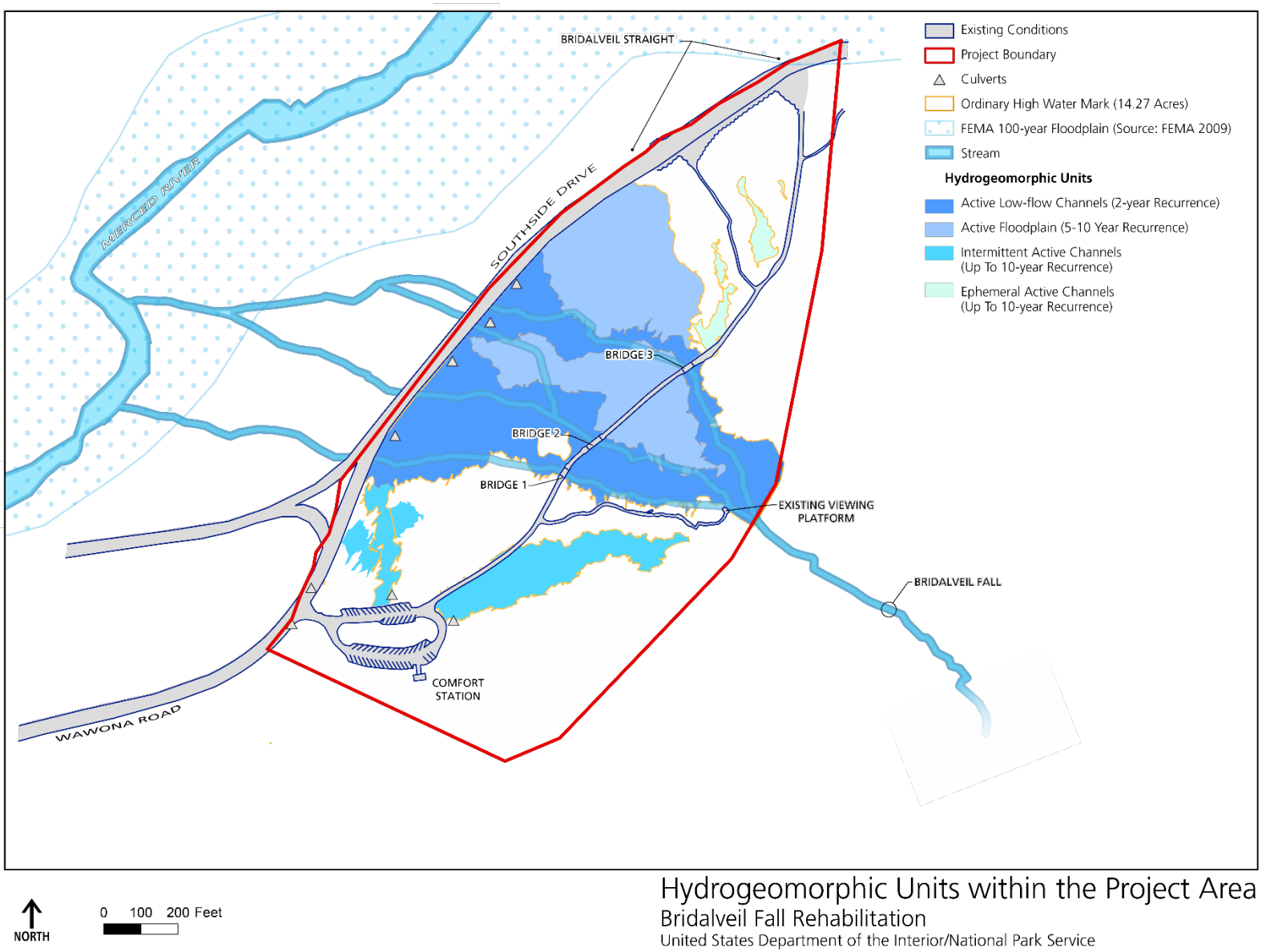


Figure 3-1. Hydrogeomorphic Units within the Project Area

Water Quality. Constituents such as dissolved oxygen, suspended sediment, nutrients, and chemical pollutants measure water quality. Water quality in the Upper Merced River Watershed is considered to be good and generally above state and federal standards (United States Geological Survey [USGS] 1999).

The State of California considers the surface water quality of most park waters to be beneficial for wildlife habitat, freshwater habitat, and for canoeing, rafting, and other recreation, as indicated in the Central Valley Regional Water Quality Control Board's (RWQCB) Water Quality Control Plan (Central Valley RWQCB 2016a). The USEPA 303(d) list of water quality limited segments in the vicinity of the facility sites does not list the Merced River and the Tuolumne River as impaired (Central Valley RWQCB 2016b). The NPS Freshwater Resource Management Guidelines (found in NPS-77) require the NPS to "maintain, rehabilitate, and perpetuate the inherent integrity of water resources and aquatic ecosystems." The Clean Water Act requires the NPS to "comply with all federal, state, interstate, and local requirements" (NPS 2004).

In general, water in the Upper Merced River Watershed is noted for low conductivity (limited dissolved solids), near-neutral pH (a measure of acid or base conditions) – low alkalinity, and low nutrient concentrations. Due to low alkalinity of the stream water, the Merced River also has low buffering capability (ability to withstand changes in water chemistry due to impacts) (NPS 1994).

The Yosemite Valley Groundwater Basin has exceptionally high quality groundwater and substantial well yields and supplies water to Yosemite National Park (California Department of Water Resources 2003).

Environmental Consequences – Methodology

Impacts to hydrology, floodplains, and water quality were assessed by reviewing existing literature and characterizing the effects based on the types of impacts that could occur, and analyzing factors that could contribute to impacts under each alternative. The analysis was based on a qualitative assessment of surface and groundwater resources, and the effects likely caused by construction and operation of proposed plan elements and infrastructure improvements.

Types of impacts include the discharge of pollutants to surface and ground waters, including sediment, hydrocarbons, and other materials; changes in the direction and runoff rate of water; and impacts to floodplains. Beneficial impacts would include protection of water resources, restoration of streambanks, maintaining natural flows and conditions, and improvements to water quality. Adverse impacts would include degradation of the chemical or physical properties of water resources, including natural or human-constructed structures. Impacts can be direct (an immediate result of the action) or indirect (resulting from the action but occurring later in time or removed from the location of direct physical impacts).

The analysis of impacts to hydrology, floodplains, and water quality is based on the assumption that the proposed action would include standard procedures related to grading and erosion control and stormwater runoff. Implementation of standard mitigation measures and best management practices (BMPs) in Appendix B would be implemented by the park, which would minimize the potential for sediment and pollutant discharge. Prior to construction, if determined necessary, the NPS would file a Notice of Intent to discharge stormwater to the RWQCB and prepare and implement provisions of a Storm Water Pollution Prevention Plan (SWPPP) to control runoff from construction activities, which would be short-term in nature. The BMPs specified in the SWPPP would specify means of waste disposal, post-construction sediment and erosion control, and maintenance responsibilities. The construction contractor(s) would also be required to implement appropriate hazardous materials management practices to reduce the possibility of chemical spills or releases of contaminants, including any non-stormwater discharge to drainage channels. Post-construction

permanent BMPs would also be implemented where deemed necessary, to minimize long-term effects from land disturbances, increased runoff, and contaminated runoff.

Environmental Consequences of Alternative 1 – No Action Alternative

Analysis. Under the No Action Alternative, hydrology, floodplains, and water quality would remain the same, and no new impacts would occur. No modifications in the project area would occur, including installation of bridges and raised walkways or raising the parking lot out of the flood zone. Existing impacts would continue, including erosion and subsequent sediment discharge, and flooding of the parking area. Informal trailing that fragments wetland habitat and alters wetland hydrology would continue. Areas that have been denuded of vegetation due to trampling would remain, resulting in compacted soils and altered runoff characteristics. This would result in an alteration of the runoff characteristics from natural conditions, though not in a detectable manner. These actions would result in a local, long-term adverse impact on hydrology.

Cumulative Impacts. Cumulative effects to hydrology are based on analysis of past, present, and reasonably foreseeable future actions within the project area in combination with the potential effects of this alternative. Past actions that cumulatively impact hydrology within the project area include construction projects, such as the *Reconstruct Critically Eroded Sections of El Portal Road*, *Parkwide Emergency Road Repairs*, *Rehabilitate the Yosemite Valley Loop Road,* and *Wawona Road Rehabilitation* projects. These may have short-term adverse impacts to hydrology, but long-term beneficial impacts. Continued implementation of the Fire and Vegetation Management Plans may include removal or trimming of trees and vegetation, which may result in localized effects to water quality, including displacement of soil. *Restoration of the Mariposa Grove of Giant Sequoias* would result in short-term ground disturbance and long-term habitat restoration with water flows directed to natural drainages and decreased traffic in the Mariposa Grove area. This could decrease erosion. Implementation of scenic vista clearing actions in the *Merced River Plan* would include removal of trees and roadside vegetation, resulting in erosion and sedimentation. Short-term effects of all projects would be mitigated by implementation of standard BMPs to protect water quality.

Reasonably foreseeable future actions that could contribute to cumulative impacts to hydrology include the Construct a Comfort Station West of Yosemite Lodge at the Yosemite Falls Parking Area and Wawona Wastewater Treatment System Project. These projects may have short-term adverse impacts to water quality during construction, which would be reduced by implementation of standard mitigation measures and BMPs discussed in Appendix B. The Wawona Wastewater Treatment System Project would result in long-term beneficial impacts to water quality through improved treatment at the upgraded facility.

Therefore, total cumulative impacts would be adverse in the short-term and adverse but beneficial in the long-term, despite the No Action Alternative contributing long-term adverse impacts to overall cumulative impact.

Environmental Consequences of Alternative 2

Analysis. Ground disturbance during construction would displace soils, potentially resulting in erosion and discharge of sediment into creeks and drainages. Use of heavy equipment to construct parking areas, bridges, facility structures, and infrastructure may result in the discharge of hydrocarbons into surface waters. These adverse impacts would be mitigated by applying standard mitigation measures and BMPs discussed in Appendix B, including delineation of project boundaries, establishment of appropriate staging areas, application of intensive erosion control measures, stabilization of loose soils and stockpiles, consistent maintenance of equipment, and adherence to spill prevention and contingency plans. This would result in a local, short-term adverse impact.

Under Alternative 2, actions within the floodplain would include raising and improving the parking lot, trenching for utility and sewer lines, trail development (accessible and rustic), boardwalks, and ecological restoration. Under Alternative 2, there would be an addition of approximately 1.75 acres of new impervious surface. The parking lot would be raised to be above flood levels. A raised boardwalk would be installed and wetlands would be restored adjacent to the parking lot, improving water quality and wetland function. Trenching for electrical and sewer lines along the road could potentially cause direct and indirect long-term adverse impacts by altering the hydrology within Bridalveil Meadow. These adverse impacts would be mitigated by applying mitigation measures such as MM-GCM-9 (Appendix B), that states that the design of the utility trench and directional drilling will allow subsurface flows to continue unimpeded, without creating an underground dam.

Under this alternative, trail improvements would include bridges, boardwalks, and elevated pathways to keep foot traffic out of many wetlands, streams, and flood zones. The addition of the bridge across Bridalveil Creek could potentially produce long-term adverse impacts by impeding flow during extreme flow events due to woody debris build up around pilings. Long-term beneficial impacts to water quality would occur as a result of reduced visitor impacts (i.e., bank and vegetation trampling), restored and revegetated areas and wetlands, and improved drainage systems. Trail improvements would include bridges and boardwalks to provide visitor access over creeks, waterways, and wetlands.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions within the project area are the same as those discussed under the No Action Alternative and would result in local, short-term adverse impacts and long-term beneficial impacts to hydrology, floodplains, and water quality. Implementation of Alternative 2 would have local, long-term beneficial impacts. Therefore, cumulative impacts would be adverse in the short-term and beneficial in the long-term, with Alternative 2 contributing long-term beneficial impacts to overall cumulative impacts.

Environmental Consequences of Alternative 3

Analysis. Alternative 3 would involve less construction and ground disturbance than Alternative 2, resulting in reduced impacts. There would be a smaller boardwalk area near the parking area and no bridges or elevated pathway over the upper portion of the Bridalveil Creek braided channel.

Ground disturbance during construction would displace soils, potentially resulting in erosion and discharge of sediment into creeks and drainages. Use of heavy equipment to construct parking areas, bridges, facility structures, and infrastructure may result in the discharge of hydrocarbons into surface waters. These adverse impacts would be mitigated by applying standard mitigation measures and BMPs discussed in Appendix B, including delineation of project boundaries, establishment of appropriate staging areas, application of intensive erosion control measures, stabilization of loose soils and stockpiles, consistent maintenance of equipment, and adherence to spill prevention and contingency plans. This would result in a local, short-term adverse impact.

Under Alternative 3, actions within the floodplain would include raising and improving the parking lot, trail development (accessible and rustic), boardwalks, and wetland restoration. However, Alternative 3 would result in approximately 1.38 acres of new impervious surface, which is less than 1.75 acres under Alternative 2; and there would no bridges or elevated pathway over the upper portion of the Bridalveil Creek braided channel. The parking lot would be raised to be above flood levels. A smaller raised boardwalk would be installed and wetlands would be restored adjacent to the parking lot, improving water quality and wetland function.

Under this alternative, trail improvements would include boardwalks and elevated pathways to keep foot traffic out of many wetlands, streams, and flood zones. While the expanded portion of the viewing platform would not extend into the bed and banks of Bridalveil Creek, a small portion of the existing platform extends into the bed and banks. Creek flows do not reach the platform at low

flows. During moderate and high flows, the platform would not substantially impact flows more than the existing boulders and trees in the very rough alluvial fan environment. Implementation of this alternative would produce long-term beneficial impacts to water quality as a result of reduced visitor impacts (i.e., bank and vegetation trampling), restored and revegetated areas and wetlands, and improved drainage systems. Trail improvements would include bridges and boardwalks to provide visitor access over creeks, waterways, and wetlands. Therefore, Alternative 3 would result in long-term beneficial impacts to hydrology, floodplains, and water quality.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions within the project area are the same as those discussed under the No Action Alternative and would result in local, short-term adverse impacts and long-term beneficial impacts to hydrology, floodplains, and water quality. Implementation of Alternative 3 would have local, long-term beneficial impacts. Therefore, cumulative impacts would be adverse in the short-term and beneficial in the long-term, with Alternative 3 contributing long-term beneficial impacts to overall cumulative impacts.

WILDLIFE

Affected Environment

Wildlife. Wildlife in Yosemite National Park is diverse and abundant, reflecting the wide range of Sierra Nevada habitats. Yosemite National Park supports over 400 species of vertebrates including fish, amphibians, reptiles, birds, and mammals (NPS 2017b).

Wildlife habitat in the project area primarily consists of mixed conifer and mixed hardwood communities. Wildlife in the project area are exposed to high levels of disturbance associated with human foot-traffic, human presence, and vehicular operation within and in the vicinity of Bridalveil Fall. Wildlife species commonly occurring in the Yosemite Valley in the vicinity of the project area include black bear (*Ursus americanus*), western grey squirrel (*Sciurus griseus*), mule deer (*Odocoileus hemionus*), acorn woodpecker (*Melanerpes formicivorus*), Steller's jay (*Cyanocitta stelleri*), dark-eyed junco (*Junco hyemalis*), mountain chickadee (*Poecile gambeli*), and peregrine falcon (*Falco peregrinus*) (California Department of Fish and Wildlife [CDFW] 2017a; NPS 2017a). There are several species of bats that are likely to occur in or near the project area, including special status bat species (see Appendix E).

Special Status Species. Special status species include species listed, proposed, or candidates for listing as endangered or threatened under the federal Endangered Species Act or California Endangered Species Act and other special status species as recognized by the United States Fish and Wildlife Service (USFWS), CDFW, or Yosemite National Park.

For this analysis, habitat associations and previous records of occurrence for park-listed sensitive animals were reviewed to determine which have the potential to occur in the project area. A USFWS Official Species List (USFWS 2017) for the proposed action was received on June 20, 2017. Two species of federally listed fish included on the list do not occur in the vicinity of the project area – Delta smelt (*Hypomesus transpacificus*) and steelhead, Northern California distinct population segment (DPS) (*Oncorhynchus mykiss*). Project activities will not impact the waters of the Merced River or its tributaries, which flow into the San Joaquin drainage and the listed species habitat, hundreds of miles below the project area. Two additional federal listed species were included on the Official Species List, Yosemite toad (*Anaxyrus canorus*) and the Sierra Nevada yellow-legged frog (*Rana sierrae*). Both of these species are not expected to occur in the project area due to habitat requirements. These species generally occur above 6,000 feet in elevation or higher (the project area occurs at about 4,000 feet in elevation). The federal listed California red-legged frog (*Rana draytonii*) is included in this analysis as it was reintroduced to several sites in east Yosemite Valley in 2017. No critical habitat for any federally listed species occurs within the project area

(USFWS 2017). Appendix E includes a table that describes the special status wildlife species potentially occurring in Yosemite Valley and their potential to occur within the project area. Special status species that potentially occur in the project area are described below.

The California red-legged frog *(Rana draytonii)* is the only federally listed species that would potentially occur in the project area. California red-legged frogs occur most commonly in lowlands or foothills near ponds in forests, woodlands, grasslands, coastal scrub, and streamsides with plant cover. Breeding habitat is in permanent or ephemeral water sources, including lakes, ponds, reservoirs, slow streams, marshes, bogs, and swamps (California Herps 2017). The species is believed to have been extirpated from Yosemite National Park, and had not been observed in the park in over 50 years (NPS 2016a). However, efforts are currently underway to reintroduce the species to the park. NPS, in conjunction with the USFWS, is reintroducing 4,000 tadpoles and 500 adults between 2017 and 2019 into several sites in east Yosemite Valley (NPS 2016a). It is highly unlikely that individuals would travel to the Bridalveil Fall project area before construction is complete.

The Mount Lyell salamander (*Hydromantes platycephalus*) is a CDFW watch list species that is generally restricted to alpine or subalpine vegetation associations in outcrops of rocks and boulders with free surface water, such as a seep, waterfall, or melting snow nearby (CDFW 2014). The species is known to occur in Yosemite Valley, and potential habitat occurs within the project area at the base of the waterfall and the associated stream channels. A daytime survey was conducted in September of 2017 at the base of the Fall above the viewing platform. No salamanders were observed during this survey.

The western pond turtle (*Actinemys marmorata*) was believed to have been extirpated from Yosemite Valley. Efforts are currently underway to reintroduce the species to the park (NPS 2016a). Reintroduced western pond turtles are being monitored using radio telemetry and are currently less than 1.5 miles from project area. There is a low probability that they could occur within the project area during construction.

Special status bird species with the potential to occur in the project area, and described in Appendix E include:

- northern goshawk (*Accipiter gentilis*)
- golden eagle (*Aquila chrysaetos*)
- Vaux's swift (*Chaetura vauxi*)
- olive-sided flycatcher (*Contopus cooperi*)
- black swift (*Cypseloides niger*)
- yellow warbler (*Dendroica petechia*)
- peregrine falcon (*Falco peregrinus*)
- bald eagle (*Haliaeetus leucocephalus*)
- California spotted owl (*Strix occidentalis occidentalis*)

Special status bat species with the potential to occur in the project area, and described in Appendix E include:

- pallid bat (*Antrozous pallidus*)
- Townsend's big-eared bat (*Corynorhinus townsendii*)
- spotted bat (*Euderma maculatum*)
- western mastiff bat (*Eumops perotis californicus*)
- western red bat (*Lasiurus blossevillii*)

Environmental Consequences – Methodology

Determination of the significance of potential impacts on wildlife is based on the duration and type of impact; the scale (area) of impact influences all. Impacts can be direct (an immediate result of the action) or indirect (resulting from the action but occurring later in time or removed from the location of direct physical impacts). Impacts to wildlife were evaluated through a qualitative assessment of changes in the diversity, continuity, and/or integrity of wildlife populations and/or habitats and an assessment of potential impacts to individual wildlife.

This impact analysis defines potential impacts as either adverse (negative) or beneficial (positive). For wildlife, direct and indirect adverse impacts remove, relocate, affect, or cause an increased disturbance to wildlife. Beneficial impacts result from preservation and minimization of impacts to wildlife and their habitats. The duration of an impact considers whether the impact would occur in the short-term (temporary) or over the long-term (permanent).

Determination of the significance of potential impacts on special status wildlife species is based on the locality, duration, and type of impact. The impact evaluation for special status species was based on the following: (1) the known or likely occurrence of a species or its preferred habitat in the vicinity of the project area; (2) the direct physical loss or adverse modification of habitat; and (3) the loss or degradation of habitat, such as could occur through avoidance or abandonment due to construction or rehabilitation activity or noise, or the species' sensitivity to human disturbance. For plant species, this could occur due to loss of habitat features such as surface water flows.

Impacts were evaluated through determination of the location of the species or their habitat with respect to the proposed rehabilitation project. Sensitivity of a species to impacts was assessed through consideration of rarity, resilience, population size, and distribution throughout the park.

Federal listed species. Determinations on federal listed species are made as follows:

- No effect – The action will not affect federal listed species or critical habitat.
- Not likely to adversely affect – The effects on listed species will be discountable, insignificant, or completely beneficial.
- Nonconcurrence – Not enough information to adequately determine the nature of the effects.
- Likely to adversely affect – An adverse impact on the species may occur as a direct or indirect result of the proposed action.

Environmental Consequences of Alternative 1 – No Action Alternative

Analysis. Under the No Action Alternative, Bridalveil Fall would not be rehabilitated and no repairs would be made with the exception of emergency repairs and routine and periodic maintenance activities. Ongoing disturbance to wildlife and sensitive species from noise, human presences, and vehicle traffic associated with the Yosemite Valley and Bridalveil Fall complex daily operations and maintenance would continue. In addition, off-trail foot traffic would continue within the project area. Therefore, there would be no new impacts on wildlife, including special status wildlife species.

Cumulative Impacts. Past and present projects that would impact wildlife within the project area include the Bridalveil Fall Vault Toilet Ventilation and Interior Lighting System Installation, Wawona Road Rehabilitation, Parkwide Emergency Road Repairs, and scenic vista management prescribed in the Merced River Plan. These actions would result in visual and noise disturbance of wildlife within the project area and thus would have localized, short-term, adverse impacts on wildlife. Additionally, these projects would result in removal of vegetation, including trees, in areas where needed, for scenic management and/or construction access.

Potential actions under the park's *Invasive Plant Management Plan Update* would result in the protection of wildlife habitat within the project area and thus would have localized, long-term beneficial impacts on wildlife.

As the No Action Alternative would impart no impact on wildlife, cumulative impacts on wildlife would be adverse in the short-term and beneficial in the long-term, with the No Action Alternative contributing no impact to overall cumulative impacts.

Environmental Consequences of Alternative 2

Analysis. Construction under Alternative 2 would have a total area of disturbance of 4.23 acres, much of which is previously disturbed and/or existing impervious surface. A total of 1.75 acres of new impervious surface would be added during construction under Alternative 2, which would entail a direct loss of potential wildlife habitat.

Local, short-term adverse impacts on wildlife would occur due to noise, increased human presence, and heavy equipment use during construction activities. Visual and noise impacts to wildlife would occur primarily in areas where wildlife are already subject to similar impacts (traffic noise, human presence, etc.). Noise and visual disturbance associated with construction may temporarily interrupt foraging, mating, and nesting behavior, or cause wildlife to temporarily avoid the area. Construction activity could also interfere with animal movement patterns. Noise, as well as an increase in general human activity and presence, could evoke negative reactions in wildlife. Trees that would be selectively removed in the project area could provide roosts, perches, or nest sites for bird and bat species, including special status species. However, by scheduling construction to largely avoid the bird breeding and nesting season, conducting pre-construction surveys for nesting birds so that no removal of active nests would occur, and avoiding construction activities at night (or, if night lighting is necessary, lighting would be designed to be minimal, directed downward, and shielded), impacts on migratory bird species and bats would be reduced. The construction of the east trail along Bridalveil Creek to the new bridge would impact habitat in a pristine area with little to no foot traffic. The presence of a new trail in this area would encourage informal trailing between the new trail and Bridalveil Creek, impacting a greater area than the trail itself.

The Mount Lyell salamander would potentially be directly impacted during trail and viewing platform construction because of the potential for harm or crushing to individuals and the potential loss of habitat. However, portions of the trail that cross aquatic habitats and areas of large boulders would be elevated or consist of a boardwalk instead of being at-grade and hardened, to reduce impacts to sensitive habitats. Therefore, impacts to the species during construction would largely be avoided and any adverse impacts would not affect the relative abundance of the local population. Following construction activities, local, indirect adverse impacts from improper disposal of human waste or foot traffic in and along streamside areas could affect this species' habitat, especially if hikers enter areas where this species and its habitat occur. However, the improved viewing area for visitors and additional trails is intended to decrease the amount of foot traffic (people going off trails and platforms) into areas where this species occurs. Likewise, under Alternative 2, additional trash cans, bear boxes, and restrooms would reduce the human impact on adjacent wildlife habitat and impart beneficial impacts on species such as the Mount Lyell salamander.

Federal listed species. In 2017, the NPS reintroduced the California red-legged frog to suitable habitat in Yosemite Valley about 1.5 miles east of the Bridalveil Fall project area. It is unlikely that frogs from this new population would travel to the Bridalveil Fall project area before construction is complete in 2019. In the highly unlikely event that the individual frogs travel to the site during construction, the NPS determined that effects on this listed species would be discountable or insignificant, and not likely to adversely affect the population.

Cumulative Impacts. Past and present projects that would impact wildlife within the project area include the Bridalveil Fall Vault Toilet Ventilation and Interior Lighting System Installation, Wawona Road Rehabilitation, Parkwide Emergency Road Repairs, and scenic vista management prescribed in the Merced River Plan. These actions would result in visual and noise disturbance of wildlife within the project area and thus would have localized, short-term adverse impacts on wildlife. Additionally, these projects would result in removal of vegetation, including trees, in areas where needed, for scenic management and/or construction access. Potential actions under the park's Invasive Plant Management Plan Update would result in the protection of wildlife habitat within the project area and thus would have localized, long-term beneficial impacts on wildlife. When combined with the potential beneficial and adverse impacts under Alternative 2, cumulative impacts on wildlife would be adverse in the short-term and beneficial in the long-term.

Environmental Consequences of Alternative 3

Analysis. Impacts to wildlife under Alternative 3 would be similar to those under Alternative 2, except that there would be less construction and associated stressors (noise and visual impacts).

Construction under Alternative 3 would have a total area of disturbance of 3.75 acres, much of which is previously disturbed and/or existing impervious surface. A total of 1.38 acres of new impervious surface would be added during construction under Alternative 3, which would entail a direct loss of potential wildlife habitat.

Local, short-term adverse impacts on wildlife would occur due to noise, increased human presence, and heavy equipment use during construction activities. Visual and noise impacts to wildlife would occur primarily in areas where wildlife are already subject to similar impacts (traffic noise, human presence, etc.). Noise and visual disturbance associated with construction may temporarily interrupt foraging, mating, and nesting behavior, or cause wildlife to temporarily avoid the area. Construction activity could also interfere with animal movement patterns. Noise, as well as an increase in general human activity and presence, could evoke negative reactions in birds and bats. Trees that would be selectively removed in the project area could provide roosts, perches, or nest sites for bird and bat species, including special status species. However, by scheduling construction to largely avoid the bird breeding and nesting season, conducting pre-construction surveys for nesting birds so that no removal of active nests would occur, and avoiding construction activities at night (or, if night lighting is necessary, lighting would be designed to be minimal, directed downward, and shielded), impacts on migratory bird species and bats would be reduced.

The Mount Lyell salamander would potentially be directly impacted during trail and viewing platform construction because of the potential for harm or crushing to individuals and the potential loss of habitat. However, portions of the trail that cross aquatic habitats and areas of large boulders would be elevated or consist of a boardwalk instead of being at-grade and hardened, to reduce impacts to sensitive habitats. Therefore, impacts to the species during construction would largely be avoided and any adverse impacts would not affect the relative abundance of the local population. Following construction activities, local indirect adverse impacts from improper disposal of human waste or foot traffic in and along streamside areas could affect this species' habitat, especially if hikers enter areas where this species and its habitat occur. However, the improved viewing area for visitors and additional trails is intended to decrease the amount of foot traffic (people going off trails and platforms) into areas where this species occurs. Likewise, under Alternative 3, additional trash cans, bear boxes, and restrooms would reduce the human impact on adjacent wildlife habitat.

Federal listed species. In 2017, the NPS reintroduced the California red-legged frog to suitable habitat in Yosemite Valley about 1.5 miles east of the Bridalveil Fall project area. It is unlikely that frogs from this new population would travel to the Bridalveil Fall project area before construction is complete in 2019. In the highly unlikely event that the individual frogs travel to the site during construction, the NPS determined that effects on this listed species would be discountable or insignificant, and not

likely to adversely affect the population. The NPS will consult with the USFWS regarding this finding prior to finalizing the NPS decision document for this environmental assessment.

Implementation of standard mitigation measures in Appendix B, as well as following avoidance procedures, would reduce the potential for disturbance and harm to wildlife. Therefore, adverse impacts to wildlife under Alternative 3 would be reduced.

Cumulative Impacts. Past and present projects that would impact wildlife within the project area include the Bridalveil Fall Vault Toilet Ventilation and Interior Lighting System Installation, Wawona Road Rehabilitation, Parkwide Emergency Road Repairs, and scenic vista management prescribed in the Merced River Plan. These actions would result in visual and noise disturbance of wildlife within the project area and thus would have localized, short-term adverse impacts on wildlife. Additionally, these projects would result in removal of vegetation, including trees, in areas where needed, for scenic management and/or construction access. Potential actions under the park's Invasive Plant Management Plan Update would result in the protection of wildlife habitat within the project area and thus would have localized, long-term beneficial impacts on wildlife. When combined with the potential beneficial and adverse impacts under Alternative 3, cumulative impacts on wildlife would be adverse in the short-term and beneficial in the long-term.

VEGETATION

Affected Environment

Vegetation. Yosemite Valley is located in the "lower montane mixed conifer zone." Vegetation within the project area is classified as lower montane broadleaf forest, lower montane coniferous forest, and riparian habitat. The California black oak forest is a component of the lower montane broadleaf forest with unique biological and cultural values. Figure 3-2 illustrates the dominant plant communities in the project area, which include coniferous trees (ponderosa pine [*Pinus ponderosa*], Douglas fir [*Pseudotsuga menziesii*], and incense cedar [*Calocedrus decurrens*]), broadleaf trees (California black oak [*Quercus kelloggii*], canyon live oak [*Quercus chrysolepis*], bigleaf maple [*Acer macrophyllum*], and white alder [*Alnus rhombifolia*]), or a mixture of coniferous and broadleaf trees. In addition, two unvegetated rock/talus areas occur in the southeastern corner of the project area along with urban developed/areas, which include dirt and paved roads, road shoulders, and other sparsely vegetated, disturbed areas (Figure 3-2).

Lower Montane Broadleaf Forest — Found between approximately 3,000 feet to 6,000 feet in elevation, the lower montane broadleaf forest is a transitional community between low-elevation broadleaved forests and higher elevation coniferous forests. In Yosemite Valley, this forest community includes areas dominated by either California black oak or canyon live oak. Canyon live oak communities grow on both north- and south-facing talus slopes and often form pure or almost pure stands.

California Black Oak Stands — The NPS recognizes California black oak trees in Yosemite Valley as a valued biological, cultural, and scenic resource. California black oak acorns play a foundational role in the diets of various animals, including bears, deer, woodpeckers, and squirrels, in the fall and winter when other food sources are not available. In addition, California black oaks provide an important habitat element for sensitive species, including the California spotted owl (*Strix occidentalis*) and the fisher (*Pekania pennanti*). California black oak stands are also associated with various fungi, including mycorrhizal species that help to exchange carbon, nitrogen, and water within soils and among plants. They also create heterogeneity of species and habitat and contribute to ecosystem resiliency (Hankins 2015). Figure 3-2 shows individual California black oaks that are within the project area and found outside of the California black oak-incense-cedar stand. Refer to the Cultural Resources section for discussion of California black oaks as a valued cultural and scenic resource.

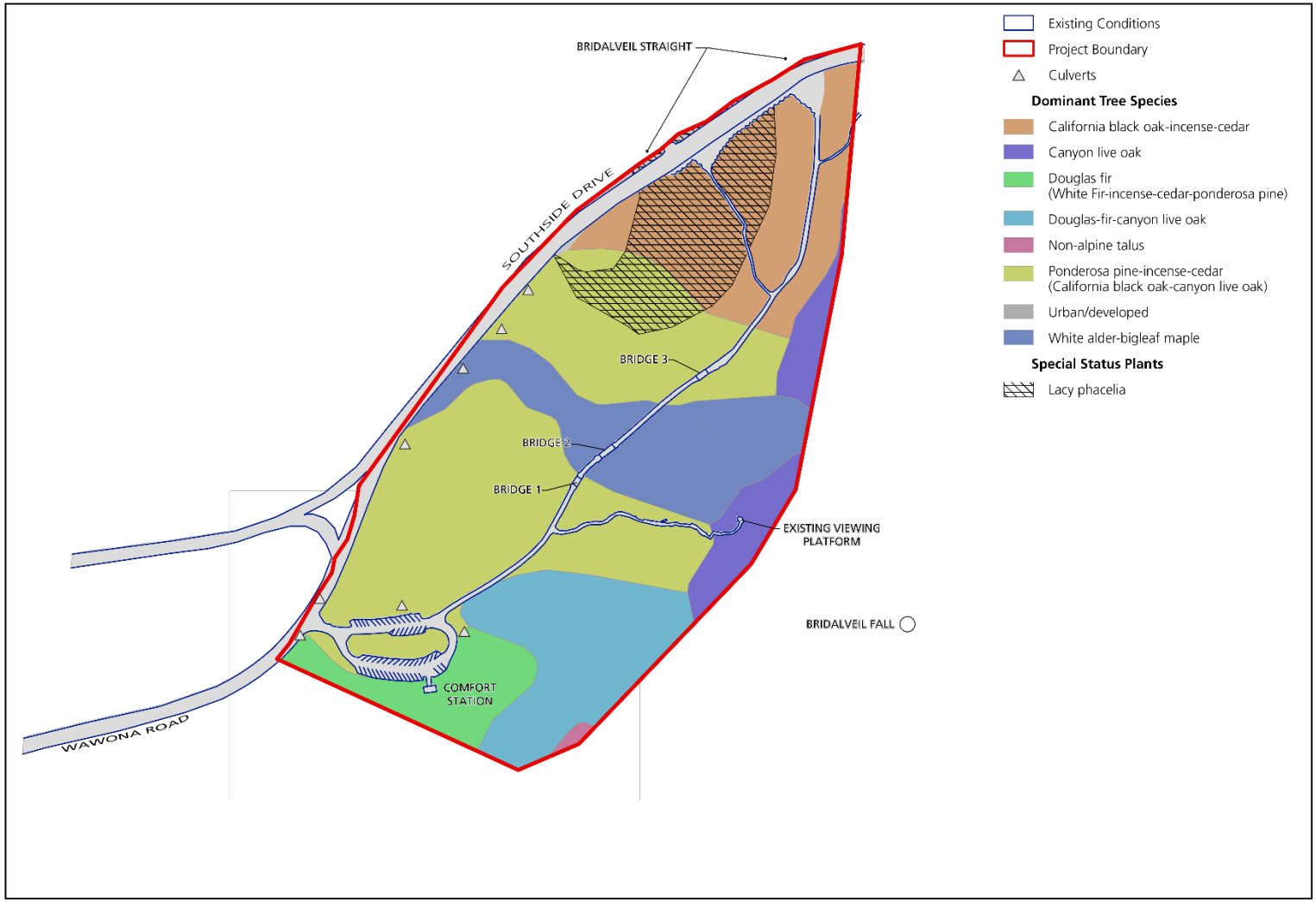


Figure 3-2. Vegetation within the Project Area

The NPS and the Yosemite Conservancy have funded a series of studies on California black oaks in response to a long-held perception that they are declining within Yosemite Valley and perhaps throughout the park. Results to date have shown that total canopy cover at 18 study locations has not decreased since 1944. Since the 1920s, however, reduced survival of saplings and juveniles has resulted in an unbalanced population structure consisting of mostly mature trees (NPS 2015).

Lower Montane Coniferous Forest — Lower montane broadleaf forest transitions to lower montane coniferous forest as elevation increases in the forest ecosystem between approximately 3,000 feet to 6,000 feet. Typically dominated by ponderosa pine, the forest community in Yosemite Valley can also contain incense cedar, sugar pine (*Pinus lambertiana*), Douglas fir, and occasional California black oaks. The most common understory shrubs are Mariposa manzanita (*Arctostaphylos viscida* spp. *mariposa*), and deerbrush (*Ceanothus integerrimus*).

Riparian Habitat — In Yosemite Valley, riparian habitat extends outward from bank edges of the Merced River and its tributaries into adjacent meadow and forest communities. Characterized by two broadleaf deciduous tree species, riparian habitat in the project area contains white alder and big-leaf maple (see Figure 3-2). Understory plants in this dynamic habitat type colonize readily on new river-edge deposits.

Riparian habitats are among the most productive and biologically diverse in Yosemite Valley. The NPS has undertaken numerous efforts to restore the underlying natural processes that sustain wetlands and riparian habitats in Yosemite Valley. These efforts include prescribed burns, invasive plant treatment, fencing, and increasing inundation levels through restoration of natural drainage patterns, among others. While these efforts have improved the overall condition of riparian habitat in Yosemite Valley, roads, parking areas, structures, campgrounds, and informal trails remain as persistent stressors. These stressors are the focus of ongoing park management efforts.

Approximately 180 nonnative plant species identified in Yosemite National Park are primarily in the chaparral/oak and mid-elevation forests. Previous invasive species mapping in the project area identified a small number of isolated, invasive plant populations prioritized for treatment, including two annual grasses (soft brome [*Bromus hordeaceus*] and cheatgrass [*B. tectorum*]), one perennial grass (bulbous bluegrass [*Poa bulbosa]*), two annual herbs (common chickweed [*Stellaria media]* and Jerusalem oak goosefoot [*Dysphania botrys*]), one perennial herb (bull thistle [*Cirsium vulgare*]), and two shrubs (Himalayan blackberry [*Rubus armeniacus*] and cutleaf blackberry [*R. laciniatus*]). The primary concern for these populations is their potential to spread. In 2011, the NPS implemented a revision to the 2008 *Invasive Plant Management Plan* to detect and control or eradicate these and other invasive non-native plants (NPS 2011b).

Special Status Species. No federally- or state-listed threatened or endangered plant species occur in the project area. One plant species in the project area, lacy phacelia (*Phacelia tanacetifolia)*, is included on Yosemite National Park's (2002) list of sensitive plants. Found in the northern portion of the project area, lacy phacelia grows in moist sandy and gravelly open areas (see Figure 3-2).

Environmental Consequences – Methodology

This vegetation analysis is based on an assessment of project area vegetation and the effects anticipated as a result of construction and continued use of the area as a sightseeing and visitor use area.

The essential qualities of plant communities include their spatial extent, integrity of species composition, association with other natural resources, and vigor in terms of growth and reproduction. Actions that reduce or degrade these qualities are considered to have adverse impacts; actions that preserve, restore, or enhance these qualities have beneficial impacts. Beneficial effects would cause no detrimental effect and would result in an increase in rare species or habitat components, native ecosystem processes, native species richness or diversity, or native habitat quantity and quality. Impacts can

be direct (an immediate result of the action) or indirect (resulting from the action but occurring later in time or removed from the location of direct physical impacts). The duration of an impact considers whether the impact would occur in the short-term (temporary) or over the long-term (permanent).

Non-native species can alter soil chemical and physical properties, hamper native species establishment, and ultimately impact native plant community structure and function. This impact analysis considered whether proposed actions would favor the establishment of non-native species, as well as the ability to contain and reverse non-native plant infestation.

Environmental Consequences of Alternative 1 – No Action Alternative

Analysis. Under the No Action Alternative, Bridalveil Fall would not be rehabilitated and no repairs would be made with the exception of emergency repairs and routine and periodic maintenance activities. Although there would be no new impacts on vegetation, it is likely that under the No Action Alternative visitors would continue to experience congestion and crowded trails/viewing platforms, and vegetation would continue to be trampled in areas where visitors go off-trail to avoid such congestion. Therefore, adverse, long-term impacts to vegetation would continue under the No Action Alternative.

Cumulative Impacts. Past and present projects that would impact vegetation within the project area include the *Wawona Road Rehabilitation*, *Parkwide Emergency Road Repairs*, and scenic vista management prescribed in the *Merced River Plan*. These actions would potentially result in temporary and permanent impacts to vegetation within the project area, including removal of trees in areas, where needed, for scenic management and/or construction access. Relative to the total vegetation within and in the vicinity of the project area, and with adherence to mitigation measures specific to each project, these adverse impacts would be reduced. Potential actions under the park's *Invasive Plant Management Plan Update* would enhance and protect native vegetation within the project area resulting in localized, long-term beneficial impacts on vegetation. Therefore, as discussed above, cumulative impacts would be adverse in the short-term and adverse and beneficial in the long-term, with the No Action Alternative contributing long-term adverse impacts to overall cumulative impacts.

Environmental Consequences of Alternative 2

Analysis. Construction activities under Alternative 2 would disturb 4.23 acres, much of which is previously disturbed and/or existing impervious surface. A total of 1.75 acres of new impervious surface would be added during construction under Alternative 2, which would entail a direct loss of lower montane broadleaf and coniferous forest and riparian vegetation. These permanent impacts would be a result of vegetation removal associated with construction activities. Additionally, individual trees would be selectively removed to improve vistas, and immature conifer trees located within the driplines of California black oaks would be removed in order to improve habitat and enhance the health of the mature oaks. Trees removed would not be of special status, and would represent an insignificant fraction of the numbers of trees in the project area. The construction of the east trail along Bridalveil Creek to the new bridge would remove vegetation from a pristine area with little to no foot traffic. The presence of a new trail in this area would encourage informal trailing between the new trail and Bridalveil Creek, impacting a greater area than the trail itself.

Short-term impacts on vegetation during construction activities could include inadvertent crushing of vegetation and soil compaction. Such impacts would be short in duration and vegetation would be expected to recover after construction activities. Adherence to mitigation measures in Appendix B, including consultation with the park vegetation ecologist and forester, would minimize potential impacts on trees and understory vegetation, as well as potential root damage. Additionally, under

Alternative 2, it is intended that informal trailing by visitors within the existing visitor use area would be reduced and impart long-term, beneficial impacts on vegetation.

Indirect effects of construction activities and continued visitor use of the Bridalveil Fall area would include the potential for non-native plant establishment and spread. Implementation of standard mitigation measures in Appendix B would reduce the potential for non-native plant dispersal. Therefore, potential impacts to vegetation under Alternative 2 would be adverse in the short-term and beneficial in the long-term.

Cumulative Impacts. Past and present projects that would impact vegetation within the project area include the *Wawona Road Rehabilitation*, *Parkwide Emergency Road Repairs*, and scenic vista management prescribed in the *Merced River Plan*. These actions would potentially result in temporary and permanent impacts to vegetation within the project area. Relative to the total vegetation within and in the vicinity of the project area, and with adherence to mitigation measures specific to each project, these impacts would be reduced. Potential actions under the park's *Invasive Plant Management Plan Update* would result in the enhancement and protection of native vegetation within the project area and thus would have localized, long-term beneficial impacts on vegetation. When combined with the impacts under Alternative 2, cumulative impacts on vegetation would be adverse in the short-term and beneficial in the long-term.

Environmental Consequences of Alternative 3

Analysis. Impacts to vegetation under Alternative 3 would be similar to those under Alternative 2, except that there would be less ground disturbance from construction activities under Alternative 3. Construction activities under Alternative 3 would disturb 3.75 acres, much of which is previously disturbed and/or existing impervious surface. A total of 1.38 acres of new impervious surface would be added during construction under Alternative 3, which would entail a direct loss of lower montane broadleaf and coniferous forest and riparian vegetation. These permanent impacts would be a result of vegetation removal associated with construction activities. Additionally, individual trees would be selectively removed to improve vistas, and immature conifer trees located within the driplines of California black oaks would be removed in order to improve habitat and enhance the health of the mature oaks. Trees removed would not be of special status, and would represent an insignificant fraction of the numbers of trees in the project area.

Short-term impacts on vegetation during construction activities could include inadvertent crushing of vegetation and soil compaction. Such impacts would be short in duration and vegetation would be expected to recover after construction activities. Adherence to mitigation measures in Appendix B, including consultation with the park vegetation ecologist and forester, would minimize potential impacts on trees and understory vegetation, as well as potential root damage. Additionally, under Alternative 3, it is expected that the additional loop trail would reduce informal trailing by visitors and impart long-term, beneficial impacts on vegetation.

Indirect effects of construction activities and continued visitor use of the Bridalveil Fall area would be the potential for non-native plant establishment and spread. Implementation of standard mitigation measures in Appendix B would reduce the potential for non-native plant dispersal. Therefore, potential impacts to vegetation under Alternative 3 would be adverse in the short-term and beneficial in the long-term.

Cumulative Impacts. Past and present projects that would impact vegetation within the project area include the *Wawona Road Rehabilitation*, *Parkwide Emergency Road Repairs*, and scenic vista management prescribed in the *Merced River Plan*. These actions would potentially result in temporary and permanent impacts to vegetation within the project area. Relative to the total vegetation within and in the vicinity of the project area, and with adherence to mitigation measures

specific to each project, these impacts would be reduced. Potential actions under the park's *Invasive Plant Management Plan Update* would result in the enhancement and protection of native vegetation within the project area and thus would have localized, long-term beneficial impacts on vegetation. When combined with the impacts under Alternative 3, cumulative impacts on vegetation would be adverse in the short-term and beneficial in the long-term.

WETLANDS

Affected Environment

Wetlands are ecologically sensitive and productive habitats that support a rich array of both plant and animal life. They sustain a great variety of hydrologic and ecological functions vital to ecosystem integrity.

The NPS classifies and maps wetland habitats according to the Federal Geographic Data Committee (FGDC) Wetlands Classification Standard (FGDC-STD-004-2013). This is a revision of the 1979 USFWS publication *Classification of Wetlands and Deepwater Habitats of the U.S.* (Cowardin et al. 1979), commonly known as the Cowardin classification system.

For wetland permitting purposes, the Clean Water Act assigns jurisdiction over "Waters of the U.S." to the USEPA, which bestowed regulatory management to the U.S. Army Corps of Engineers (USACE). "Waters of the U.S." include features such as streams, rivers, bays, mudflats, washes, tributaries, and impoundments. "Waters of the U.S." that do not meet the specific qualifications for a jurisdictional wetland may be classified as "Other waters of the U.S." These "Other waters" may include unvegetated portions of waterways and drainages along creeks and rivers. The USACE uses the *1987 Corps of Engineers Wetlands Delineation Manual* (1987 Environmental Laboratory) and regional supplements as the standard for regulatory purposes.

The FGDC Wetlands Classification Standard (NPS policy) encompasses more aquatic habitat types than the 1987 USACE Manual used for permitting purposes. The first step for a NPS wetland analysis is to delineate all wetlands in the project area, without regard to regulatory jurisdiction. Once complete, the NPS and USACE determine the treatment of each wetland affected by the proposed action. Any direct impacts to wetlands from grade and/or fill activities would be permitted and mitigated for under Section 404 of the Clean Water Act.

The NPS Director's Order 77-1: *Wetland Protection* states that NPS units are required to: (1) minimize the destruction, loss, or degradation of wetlands; (2) preserve and enhance the natural and beneficial values of wetlands; and (3) avoid direct or indirect support of new construction in wetlands unless there are no practicable alternatives to such construction and the proposed action includes all practicable measures to minimize harm to wetlands. The USACE Section 404 permit program regulates only the dredging or placement of fill material in jurisdictional waters of the U.S.

The Bridalveil Fall project area is a dynamic wetland area with 8.81 acres of wetland features including the braided stream channel of Bridalveil Creek (Riverine Upper Perennial Streambed wetland) and Riverine Intermittent Streambed wetlands that flow in and out of the northeast corner of the parking lot area. There are also channels that flow less often that the USACE considers Intermittent Other Waters of the U.S and Ephemeral Other Waters of the U.S. (5.76 acres) (Figure 3-3). Two hydrophytic plant species were identified within the ordinary high water mark for many mapped features (white alder [*Alnus rhombifolia*] and California bay laurel [*Umbellularia californica*]). Soils in the area are classified as mollic xerofluvents (young hydric soils with shallow organic horizons).

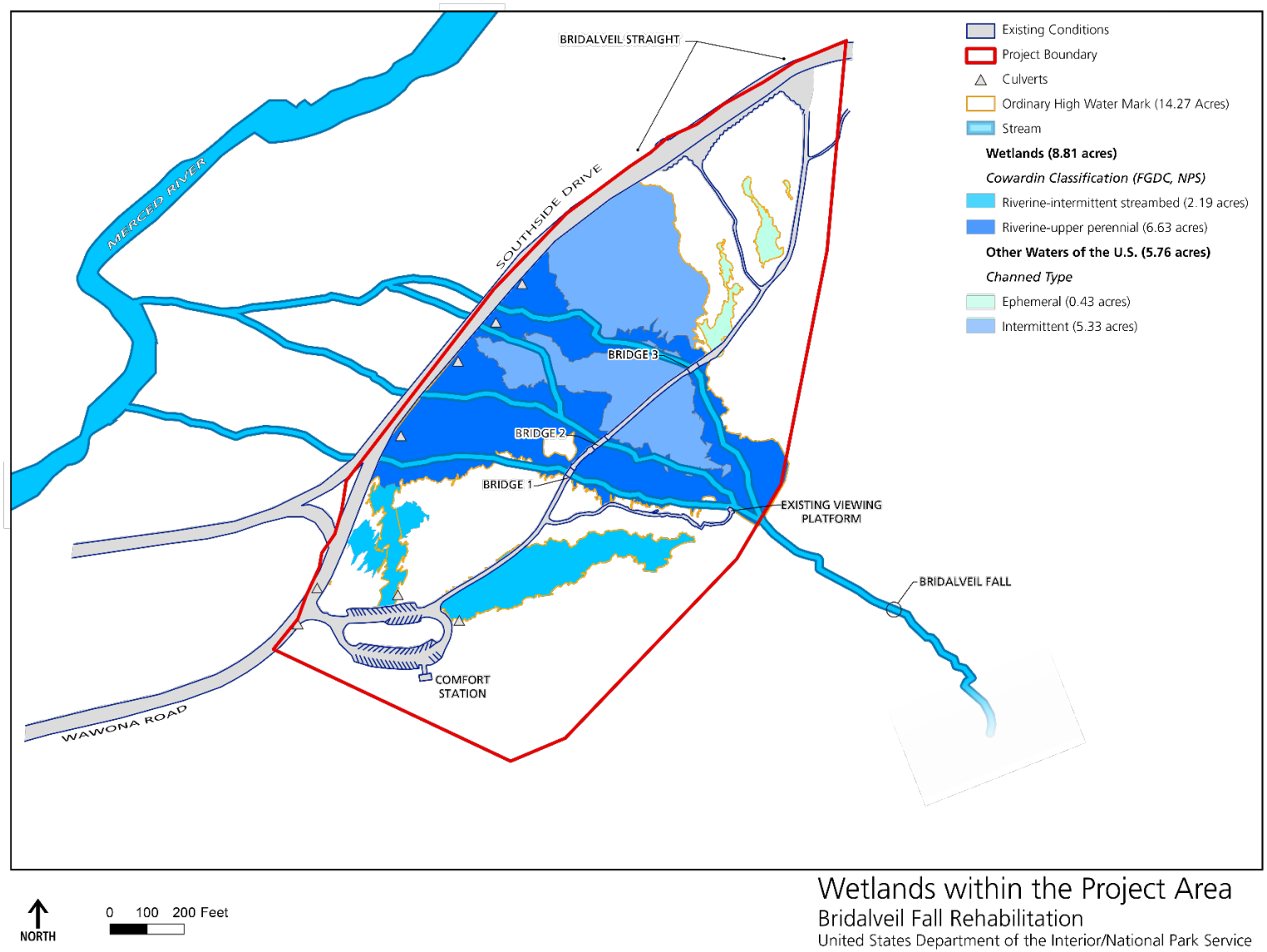


Figure 3-3. Wetlands within the Project Area

Environmental Consequences – Methodology

Wetland resources were analyzed using qualitative and quantitative assessment of impacts on wetland resources likely caused by the construction activities associated with rehabilitation of Bridalveil Fall. The results of the 2015/2016 wetland delineation (NPS 2017a) conducted within the proposed project area were used to inform the following analysis.

The wetland protection statutes that guide the NPS include Executive Order 11990, *Protection of Wetlands*; Director's Order 77-1: *Wetland Protection*, and its accompanying Procedural Manual 77-1; the Clean Water Act Sections 10 and 404; and the "no net loss" goal outlined by the White House Office on Environmental Policy in 1993. Executive Order 11990 requires agencies to minimize the destruction, loss, or degradation of wetlands. NPS's Director's Order 77-1 and Procedural Manual 77-1 provide specific procedures for carrying out Executive Order 11990.

This project is exempt from preparation of a Wetland Statement of Findings because the proposed actions in the preferred alternative are "excepted actions" according to Section 4.2.1 of NPS Procedural Manual 77-1: *Wetland Protection*. Excepted actions as defined in Director's Order 77-1 may include:

- Scenic overlooks and foot/bike trails or boardwalks, including signs, where primary purposes include public education, interpretation, or enjoyment of wetland resources, and where total wetland impacts from fill placement are 0.1 acre or less.
- Maintenance, repair, or renovation (but not full reconstruction or expansion) of currently serviceable facilities or structures.
- Minor stream crossings for underground utility lines.

Environmental Consequences of Alternative 1 – No Action Alternative

Analysis. Under the No Action Alternative, Bridalveil Fall would not be rehabilitated and no repairs would be made with the exception of emergency repairs and routine and periodic maintenance activities. Although there would be no new impacts on wetlands, it is likely that under the No Action Alternative visitors would continue to experience congestion and crowded trails/viewing platforms, and wetlands would continue to be adversely impacted in areas where visitors go off-trail to avoid such congestion. Potential short- and long-term impacts to wetlands include erosion and sedimentation, altered hydrology, and trampling of wetland vegetation. Therefore, adverse short- and long-term impacts to wetlands would continue under the No Action Alternative.

Cumulative Impacts. Past and present projects that would potentially impact wetlands within the project area include the *Wawona Road Rehabilitation*, *Parkwide Emergency Road Repairs*, and scenic vista management prescribed in the *Merced River Plan*. These actions would potentially result in localized adverse impacts on wetlands. Any permanent impacts to wetlands from grade or fill activities would be permitted and mitigated for under Section 404 of the Clean Water Act. Therefore, any impacts to wetlands would be mitigated for and potential adverse impacts would be reduced. Potential actions under the park's Invasive Plant Management Plan Update would result in the enhancement and protection of wetland vegetation within the project area and thus would have localized, long-term beneficial impacts on wetland values. Therefore, cumulative impacts would be adverse in the short-term and adverse and beneficial in the long-term, with the No Action Alternative contributing long-term adverse impacts to overall cumulative impacts.

Environmental Consequences of Alternative 2

Analysis. Under Alternative 2, piers constructed to support the bridge across Bridalveil Creek would impact Riverine Upper Perennial Streambed wetlands. The exact acreage would be determined as bridge design progresses, but impacts would be less than 0.10 acre. Piers constructed to support the

pedestrian paths over wetland areas toward the existing viewing platform would be constructed to avoid Riverine Intermittent Streambed wetlands, but there could be minor impacts if piers are necessary within the wetland (less than 0.10 acre). The viewing area to the southwest of Bridge 3 would be improved within an Ephemeral Other Waters of the U.S. Imported material to improve the site would be pervious material. Boardwalk, decking, and platform materials and sealants will be non-toxic where possible. There would be no impacts to existing hydrophytic vegetation, as none is present, or hydrologic flows. Impacts would be negligible. The small viewing platform constructed to the northeast of Bridge 3 would also be within an Ephemeral Other Waters of the U.S. The viewing area would not impact hydrophytic vegetation, as none is present, or hydrologic flows. Impacts to the Ephemeral Other Waters of the U.S. in this location would also be negligible. The pedestrian pathway would be designed and constructed with elevated portions over wetland drainages to avoid permanent impacts to wetlands and hydrological processes that sustain wetlands. Any direct impacts to wetlands from grade and/or fill activities would be permitted and mitigated for under Section 404 of the Clean Water Act, and potential adverse impacts would be reduced.

Short-term impacts, including trampling, increased sedimentation, and other temporary impacts to wetlands may occur from construction-related activities in the project area. Adherence to mitigation measures in Appendix B that specify conditions for work in streambeds, regrading and restoration within streams and wetlands, fencing and avoidance of aquatic habitats, and monitoring would minimize these adverse impacts to localized and short-term. Additionally, under Alternative 2, it is expected that informal trailing by visitors within the existing visitor use area would be reduced and impart long-term, beneficial impacts on wetlands. However, the new trail on the east side of the creek is likely to encourage new informal trailing towards the existing viewing platform. This would result in long-term adverse impacts to wetlands.

Cumulative Impacts. Past and present projects that would potentially impact wetlands within the project area include the *Wawona Road Rehabilitation*, *Parkwide Emergency Road Repairs*, and scenic vista management prescribed in the *Merced River Plan*. These actions would potentially result in localized adverse impacts on wetlands. Any permanent impacts to wetlands from grade or fill activities would be permitted and mitigated for under Section 404 of the Clean Water Act. Therefore, any impacts to wetlands would be mitigated for and potential adverse impacts would be reduced. Potential actions under the park's *Invasive Plant Management Plan Update* would result in the enhancement and protection of wetland vegetation within the project area and thus would have localized, long-term beneficial impacts on wetlands. Therefore, cumulative impacts would be adverse in the short-term and adverse and beneficial in the long-term, with Alternative 2 contributing short-term adverse impacts and long-term beneficial impacts to overall cumulative impacts.

Environmental Consequences of Alternative 3

Analysis. Piers constructed to support the pedestrian paths over wetland areas toward the existing viewing platform would be constructed to avoid Riverine Intermittent Streambed wetlands, but there could be minor impacts if piers are necessary within the wetland (less than 0.10 acre). The viewing area to the southwest of Bridge 3 would be improved within an Ephemeral Other Waters of the U.S. Imported material to improve the site would be pervious material. There would be no impacts to existing hydrophytic vegetation, as none is present, or hydrologic flows. Impacts would be negligible. The small viewing platform constructed to the northeast of Bridge 3 would also be within an Ephemeral Other Waters of the U.S. The viewing area would not impact hydrophytic vegetation, as none is present, or hydrologic flows. Impacts to the Ephemeral Other Waters of the U.S. in this location would also be negligible. The pedestrian pathway would be designed and constructed with elevated portions over wetland drainages to avoid permanent impacts to wetlands and hydrological processes that sustain wetlands. Short-term impacts, including trampling, increased sedimentation,

and other temporary impacts to wetlands may occur from construction-related activities in the project area. Adherence to mitigation measures in Appendix B that specify conditions for work in streambeds, regrading and restoration within streams and wetlands, fencing and avoidance of aquatic habitats, and monitoring would minimize these adverse impacts to localized and short-term. Additionally, under Alternative 3, it is expected that the new loop trail would reduce informal trailing by visitors and impart long-term beneficial impacts on wetlands.

Cumulative Impacts. Past and present projects that would potentially impact wetlands within the project area include the *Wawona Road Rehabilitation*, *Parkwide Emergency Road Repairs*, and scenic vista management prescribed in the *Merced River Plan*. These actions would potentially result in localized adverse impacts on wetlands. Any permanent impacts to wetlands from grade or fill activities would be permitted and mitigated for under Section 404 of the Clean Water Act. Therefore, any impacts to wetlands would be mitigated for and potential adverse impacts would be reduced. Potential actions under the park's *Invasive Plant Management Plan Update* would result in the enhancement and protection of wetland vegetation within the project area and thus would have localized, long-term beneficial impacts on wetlands. Therefore, cumulative impacts would be adverse in the short-term and adverse and beneficial in the long-term, with Alternative 3 contributing short-term adverse impacts and long-term beneficial impacts to overall cumulative impacts.

SCENIC RESOURCES

Affected Environment

In 1864, Congress passed landmark legislation to set aside Yosemite Valley and Mariposa Grove "for public use, resort, and recreation." This was the first time Congress set aside public lands for the express purpose of preserving scenic and natural values. The Organic Act (16 United States Code [USC] 1) of 1916 mandated that all visual resources within National Parks are to be conserved and managed in an unimpaired condition for the enjoyment of future generations. The 1980 *Yosemite General Management Plan* (NPS 1980) specifies the following management objectives to preserve, protect, and restore scenic resources:

- Identify the major scenic resources and the places from which they are viewed.
- Provide for the preservation or protection of existing scenic resource and viewing stations.
- Provide for historic views through vista clearing.
- Permit only those levels and types of use that are compatible with the preservation or protection of the scenic resources and with the quality of the viewing experience.

A Yosemite visitor study conducted in the summer of 2009 indicated that the most common visitor activity was viewing scenery (93%) (Blotkamp et al. 2010). A comprehensive analysis of existing and historic views conducted in the late 1970s found that Bridalveil Fall was one of 11 most important scenic icons in Yosemite Valley.

BRIDALVEIL FALL

This description and analysis considers scenic vistas in the project area from three perspectives:

- Selective clearing proposed in this plan to enhance views as proposed in Alternatives 2 and 3 and impacts of the plan on established viewpoints in the *Merced River Plan*.
- Historic viewpoints that are contributing elements to the Yosemite Valley Historic District (analyzed under Cultural Resources - Built Environment).
- Effects of Bridalveil Fall scenic vista treatments that are prescribed in the *Merced River Plan* (described in Appendix B, Cumulative Effects of the *Merced River Plan* and analyzed under Cumulative Effects for each alternative). The plan also considers views of El Capitan from Bridalveil Straight.

The *Merced River Plan* identifies six Bridalveil Fall vistas in west Yosemite Valley and it prescribes treatments to maintain the views. Originally, the *Scenic Vista Management Plan/Environmental Assessment* (*Scenic Vista Plan*) (NPS 2011c) identified and described treatments for these six scenic vistas. The *Merced River Plan* ultimately analyzed and directed the six vista management actions and others in the Merced River corridor. The *Scenic Vista Plan* based the selection of the six scenic vistas on vividness, uniqueness, access, and intactness of each vista point. The *Scenic Vista Plan* also considered a comprehensive scenic analysis conducted in the late 1970s in conjunction with the *Yosemite General Management Plan*. Bridalveil Fall project actions that could impact these six vistas (e.g., new development in a native landscape) are considered in the analysis of each Alternative.

This description and analysis also considers the mandated protection of scenic ORVs as prescribed in the *Merced River Plan*. The *Merced River Plan* identifies one scenic ORV in Segment 2B - *Iconic Scenic Views in Yosemite Valley: Visitors to Yosemite Valley experience views of some of the world's most iconic scenery, with the river and meadows forming a placid foreground to towering cliffs and waterfalls*. The NPS must maintain high priority scenic vista points, perform a contrast analysis on all new proposed structures in the segment, and take action to keep proposed structures appropriate to the Yosemite Valley landscape to protect the scenic ORV.

Environmental Consequences – Methodology

The scenic resources analysis considers substantial changes that could alter the (1) existing landscape character, whether foreground, intermediate ground, or background, that would be visible from important viewpoints; (2) access to historically important viewpoints or sequence of viewpoints; or (3) the visibility of a viewpoint or sequence of viewpoints. This analysis considers impacts on the six scenic vistas identified in the *Merced River Plan*, the selective clearing proposed in this plan to enhance additional views, and additional opportunities for viewing as proposed in

Alternatives 2 and 3. The analysis considers actions to maintain scenic vistas in the *Merced River Plan* under the cumulative analysis.

Impacts on scenic resources were examined and determined by comparing the existing visual character of the landscape in terms of the color, contextual scale, and formal attributes of landscape components and features, and the degree to which actions that may result from the proposed action would affect (i.e., contrast or conform with) that character. The analysis considers changes in experiential factors, such as whether a given action would result in a visible change, the duration of any change in the visual character, the distance and viewing conditions under which the change would be visible, and the number of viewers that would be affected.

Impacts were evaluated in terms of whether they would be beneficial or adverse to scenic resources. Beneficial impacts would enhance the existing landscape character, access to historically important viewpoints or sequence of viewpoints, or the visibility of a viewpoint or sequence of viewpoints. Adverse impacts were considered those that focus viewing on human constructed modifications or add development into the native landscape. Beneficial impacts would enhance a natural scenic view or provide additional opportunities for viewing.

Environmental Consequences of Alternative 1 – No Action Alternative

Analysis. Under Alternative 1, the No Action Alternative, scenic resources would remain the same, and no new impacts would occur. Existing views would be maintained, but would not be enhanced, no additional project specific selecting thinning would occur from viewpoints, and no new viewing areas would be created. Historic scenic views of Bridalveil Fall would continue to be obscured, except where prescribed in the *Merced River Plan*. As a result, there would be a local, long-term adverse impact on scenic resources.

Cumulative Impacts. Cumulative impacts to scenic resources are based on analysis of past, present, and reasonably foreseeable future actions within the project area in combination with the potential effects of this alternative. Present actions that cumulatively impact scenic resources within the project area include treatments to maintain the six Bridalveil Fall views described in the *Merced River Plan*. These projects have a long-term beneficial impact on scenic resources. Under Alternative 1, no existing views would be enhanced and no new viewing areas would be created. As a result, Alternative 1, in conjunction with past actions, would contribute to a long-term beneficial cumulative impact on scenic resources.

Environmental Consequences of Alternative 2

Analysis. Under Alternative 2, there would be short-term adverse impacts on scenic resources within the project area during construction due to ground disturbance, intrusive light, presence of construction equipment and vehicles, and presence of personnel. Construction within the project area would impact both scenic views of El Capitan and Bridalveil Fall. These impacts would be localized and end once the construction is complete.

There would be long-term beneficial impacts to scenic resources within the project area as a result of selective tree thinning to enhance existing views and additional opportunities for viewing areas within the project area. A new gathering area with views of Bridalveil Fall and El Capitan along Southside Drive would be constructed, with trees selectively removed to enhance the view of El Capitan. Several additional viewing areas would be created, including a new viewing area near the parking lot restrooms, a new viewing platform on the new accessible loop trail, a new viewing area northeast and southwest of Bridge 3, a viewing area near the new comfort station at Bridalveil Straight, and the entire new bridge spanning 3,300 square feet across Bridalveil Creek would serve as a dramatic new viewing area. Selective tree clearing would take place as needed to enhance views.

Construction of the new comfort station on Bridalveil Straight and a new bridge across Bridalveil Creek would introduce new structures into a native landscape. The degree to which these structures would harmonize or detract from the landscape would be mitigated in part by the application of the Yosemite Design Guidelines (NPS 2011a). The new comfort station would intrude into the Bridalveil Straight Interpretive Sign scenic vista identified in the *Merced River Plan*. The bridge would be within some views of Bridalveil Fall from the west trail along Bridalveil Creek. While designed to fit into the natural landscape, the scale and presence of the bridge would change the existing character of the natural setting. The design features of the proposed improvements and facilities would be compatible with the Yosemite Design Guidelines (NPS 2011a), but they would change the setting and character of the natural landscape, and would result in reduced scenic quality.

Cumulative Impacts. Cumulative impacts to scenic resources are based on analysis of past, present, and reasonably foreseeable future actions within the project area in combination with the potential effects of this alternative. Present actions that cumulatively impact scenic resources within the project area include treatments to maintain the six Bridalveil Fall views described in the *Merced River Plan*. The new comfort station would intrude into the Bridalveil Straight Interpretive Sign scenic vista identified in the *Merced River Plan*. These projects, in conjunction with Alternative 2, would have long-term beneficial cumulative impacts on scenic resources.

Environmental Consequences of Alternative 3

Analysis. Short-term impacts to scenic resources under Alternative 3 would be similar to those under Alternative 2, except that construction activities under Alternative 3 would likely take less time under Alternative 2. Short-term adverse impacts on scenic resources within the project area would occur during construction due to ground disturbance, intrusive light, presence of construction equipment and vehicles, and presence of personnel. Construction within the project area would impact both scenic views of El Capitan and Bridalveil Fall. These impacts would be localized and end once the construction is complete.

Long-term impacts to scenic resources under Alternative 3 would differ from Alternative 2, as there would not be a viewing bridge across Bridalveil Creek. Instead, the existing viewing platform at the base of the Fall would be enlarged from 400 square feet to 1,500 square feet. This expanded platform would impact views at ground level from the west trail, but it would not silhouette or block views of the fall. There would be long-term beneficial impacts to scenic resources within the project area as a result of selective tree thinning to enhance existing views and open up additional viewing areas within the project area. A new gathering area with views of Bridalveil Fall and El Capitan along Southside Drive would be constructed, with trees selectively removed to enhance the view of El Capitan. Several additional viewing areas would be created, including a new viewing area near the parking lot restrooms, a new viewing platform on the new accessible loop trail, a new viewing area northeast and southwest of Bridge 3, and a smaller overlook with views of the fall would be added to the new accessible loop trail, approximately 700 square feet, would be added to the new accessible loop trail south of the existing platform. Selective tree clearing would take place as needed to enhance views. The design features of the proposed improvements and facilities would be compatible with the Yosemite Design Guidelines (NPS 2011a), would be compatible with the setting and character of the area, and would not result in reduced scenic quality.

Cumulative Impacts. Cumulative effects to scenic resources are based on analysis of past, present, and reasonably foreseeable future actions within the project area in combination with the potential effects of this alternative. Present actions that cumulatively impact scenic resources within the project area include treatments to maintain the six Bridalveil Fall views described in the *Merced River Plan*. These projects, in conjunction with Alternative 3, would have long-term beneficial cumulative impacts on scenic resources.

SOILS AND GEOLOGY

Affected Environment

Bridalveil Fall is in the southwestern portion of the Yosemite Valley within Yosemite National Park and is the first major waterfall that visitors see when entering the valley. The cliffs of Yosemite Valley, including those in the Bridalveil Fall project area, are composed of Cretaceous-age granitic rocks (Calkins et al. 1985). These granitic rocks are particularly strong and generally lack fractures, allowing for the preservation of very steep cliffs.

A combination of uplift of the Sierra Nevada, stream erosion, and glacial erosion formed the hanging valleys and multiple waterfalls in Yosemite Valley. The Bridalveil Creek hanging valley is unique to the area due to its deeply incised V-shape, indicating prolonged stream erosion. Differential erosion between the glacially carved Yosemite Valley and the primarily stream carved Bridalveil Creek valley left the latter valley "hanging" above the floor of the former. From the lip of this hanging valley, Bridalveil Fall plummets 617 feet, producing the famous drenching mists as the base of the fall (Matthes 1930).

Since glaciers last retreated from Yosemite Valley approximately 15,000 years ago, rockfalls have become the most potent geological force acting in Yosemite Valley, with a rockfall occurring somewhere in the valley every week on average (Stock et al. 2013). Some of the Bridalveil Fall project area is considered subject to rockfall hazard (Stock et al. 2014), most notably the viewing platform at the base of the waterfall.

Ground shaking associated with earthquakes generated by distant seismically active fault zones is also a risk for the Bridalveil Fall project area. Relative to other areas of California, the project area is located in a low seismic hazard zone. However, large earthquakes are possible along the active fault zone along the eastern edge of the Sierra Nevada range resulting in ground shaking severe enough to cause structural damage to the Bridalveil Fall amenities and rockfalls along the steep cliffs adjacent to the waterfall.

The Natural Resources Conservation Service (NRCS) has identified approximately 120 soil types within Yosemite National Park. The variation in soil composition within the region is dependent on glacial history, current weathering and stream erosion/deposition, and differences in microclimates and vegetation. Primarily, the soil in the region is of granitic composition from the underlying granitic bedrock (NRCS 2007).

The Bridalveil Fall project area has two distinct types of sedimentary substrate: (1) colluvial deposits at the top of the fall and at the base of the cliff, and (2) alluvial deposits within the valley adjacent to the fall. The colluvial deposits are derived primarily from rockfalls, and consist mainly of coarse, angular rock fragments with minor components of granitic sand and decomposed plant material. The majority of the infrastructure within the Bridalveil Fall project area is built on top of the alluvial deposits. These alluvial deposits consist primarily of fine to coarse granitic sandy loam and include minor components of coarse rock fragments and occasional boulders. There is a high erosive potential for the alluvial deposits due to poorly developed topsoil that is generally thin and sandy, and the proximity to flowing water that can cause erosion through flooding, channel cutting, undercutting, and other stream mechanisms (NRCS 2007).

Along the Bridalveil Fall trails, erosion is a serious concern due to the high traffic volume and soil characteristics. The high traffic volume along the Bridalveil Fall trails also causes soil compaction due to the thin layer of soil and the hard granitic bedrock. Soil compaction reduces the ability of surface water to infiltrate soil and increases runoff and erosion of the already highly erosive alluvial deposits.

Environmental Consequences – Methodology

Impacts to geology and soils were analyzed through qualitative assessment of soil types, geological features, and rock fall hazard zones. Types of geology and soil impacts include those resulting from soil removal, compaction, erosion, and contamination; increased risk of rock fall hazards; and construction on top of rocks and boulders. These factors along with mitigation strategies were considered in determining potential impacts on geology and soils under each alternative.

Potential impacts were characterized into short- and long-term impacts and beneficial and adverse impacts. Beneficial impacts would protect soils from erosion, decrease rock fall hazards, and include very little soil or rock/boulder removal; adverse impacts would increase erosion of soil, increase the rock fall hazard, and include a considerable amount of soil or rock/boulder removal. Impacts can be direct (an immediate result of the action) or indirect (resulting from the action but occurring later in time or removed from the location of direct physical impacts).

Environmental Consequences of Alternative 1 – No Action Alternative

Analysis. Under the No Action Alternative, there would be no new impacts to the geology and soils in the Bridalveil Fall project area. Bridalveil Fall would not be rehabilitated and no repairs would be made with the exception of emergency repairs and routine and period maintenance activities. The current configuration of the Bridalveil Fall area does not support the amount of visitors who frequent the area. The parking lot would continue to be overcrowded and prone to flooding allowing an increased risk of soil contamination from surface runoff. The Bridalveil Fall trail system and viewing platform would continue to be heavily congested and visitors may move off the developed trails compacting soils and increasing soil erosion. With the current conditions at the Bridalveil Fall area, potential soil contamination from surface runoff, soil compaction, and soil erosion would continue causing long-term adverse impacts.

Cumulative Impacts. Localized, short-term adverse impacts on surface and sub-surface soils could result from construction activities associated with some of the past, current, and reasonably foreseeable actions planned or approved within the park. Past projects that contributed to adverse impacts on soils include *Parkwide Emergency Road Repairs, Wawona Road Rehabilitation,* and *Reconstruct Critically Eroded Sections of El Portal Road*. However, these projects would also result in localized long-term, beneficial impacts by improving drainage and decreasing soil erosion. Present work that has the potential to affect geology and soils includes planned tree removal of moderate to large conifers at several scenic vistas in the Bridalveil Fall area. No future or foreseeable projects within the park could affect geology and soils.

When combined with the long-term adverse impacts associated with the No Action Alternative, cumulative impacts on geology and soils would be long-term and adverse, with the No Action Alternative contributing noticeable adverse impacts to overall cumulative impacts.

Environmental Consequences of Alternative 2

Analysis. Under Alternative 2, disturbance to geology and soils could result from the following activities: parking lot and entrance modifications, expansion of the trails and gathering and viewing areas, construction of the new comfort stations and bridge across Bridalveil Creek, and paving of the Carriage Road Trail (Bridalveil Fall Trail). Geology and soils would be affected within the project area wherever paving, excavation, and/or fill is proposed. Under Alternative 2, approximately 4.23 acres of surface and near-surface soils would potentially be disturbed as part of the construction activities, the majority of which would include the repavement of parking area and existing trails and the paving of the existing Bridalveil Fall Trail. As a part of these construction activities, there would be an increase of approximately 1.75 acres of impervious surfaces and an additional 0.22 acre of boardwalks and elevated paths installed.

Construction-related impacts from the use of equipment and worker foot-traffic within the project area would cause local, short-term adverse impacts due to soil compaction, soil erosion, soil contamination, and displacement of soil and boulders. BMPs and mitigation measures such as MM-GEO-1 found in Appendix A would minimize these impacts and risks.

Under Alternative 2, the parking lot would be reconfigured to be above flood levels, existing culverts and headwalls would be reconstructed, and the connection between the existing trailhead and the parking lot would be widened and raised using fill. This would reduce flooding and the potential for soil contamination from surface water runoff, thus providing a local, long-term beneficial impact. Electric and sewer lines for the new comfort station would be placed within the existing footprint of the road avoiding the disturbance of any previously undisturbed soil. However, during the installation of the electric and sewer lines, some soil would be displaced.

The construction of the new trails and viewing areas would cause local, short-term adverse impacts of soil erosion, soil compaction, and displacement of soil and boulders. However, they are intended to reduce informal trailing in natural areas, which would be beneficial in the long-term by decreasing soil erosion and compaction. In addition, the expansion of trails within the rockfall hazard zone would likely increase visitor exposure to rockfall hazards. This would be a local, long-term adverse impact. Therefore, impacts to geology and soils under Alternative 2 would be adverse in the short-term and both adverse and beneficial in the long-term.

Cumulative Impacts. Localized, short-term adverse impacts on surface and sub-surface soils could result from construction activities associated with some of the past, current, and reasonably foreseeable actions planned or approved within the park. Past projects that contributed to adverse impacts on soils include *Parkwide Emergency Road Repairs, Wawona Road Rehabilitation,* and *Reconstruct Critically Eroded Sections of El Portal Road.* These projects would also result in localized, long-term beneficial impacts by improving drainage and decreasing soil erosion. Present work that has the potential to affect geology and soils includes planned tree removal of moderate to large conifers at several scenic vistas in the Bridalveil Fall area. No future or foreseeable projects within the park could affect geology and soils.

When combined with the impacts under Alternative 2, cumulative impacts on geology and soils would be adverse in the short-term and beneficial in the long-term.

Environmental Consequences of Alternative 3

Analysis. Under Alternative 3, disturbance to geology and soils would be similar to that under Alternative 2; however, disturbance to soils would be less. Under Alternative 3, approximately 3.75 acres of surface and near-surface soils would potentially be disturbed as part of the construction activities, the majority of which would include the repavement of parking area and existing trails, expansion of the existing viewing platform, and the paving of the existing Bridalveil Fall Trail. As a part of these construction activities, there would be an increase of approximately 1.38 acres of impervious surfaces and an additional 0.16 acre of boardwalks and elevated paths installed. Additional disturbance would result from the construction of an additional entrance into the parking lot; however, there would not be an additional bathroom at Bridalveil Straight, a bridge/viewing platform across Bridalveil Creek, or a second continuous loop trail from the existing viewing platform to the Bridalveil Fall Trail.

Construction-related impacts from the use of equipment and worker foot traffic within the project area would cause local, short-term adverse impacts due to soil compaction, soil erosion, soil contamination, and displacement of soil and boulders. BMPs and mitigation measures such as MM-GEO-1 found in Appendix A would minimize these impacts and risks.

Under Alternative 3, the parking lot would be reconfigured to be above flood levels, existing culverts and headwalls would be reconstructed, and the connection between the existing trailhead and the parking lot would be widened and raised using fill. This would reduce flooding and the potential for soil contamination from surface water runoff, thus providing a local, long-term beneficial impact. Electric and sewer lines for the new comfort station would be placed within the existing footprint of the road avoiding the disturbance of any previously undisturbed soil. However, during the installation of the electric and sewer lines, some soil would be displaced.

The construction of the new trails and viewing areas would cause local, short-term adverse impacts of soil erosion, soil compaction and displacement of soil and boulders. However, the new loop trail is intended to reduce informal trailing in natural areas, which would be beneficial in the long-term by decreasing soil erosion and compaction.

Cumulative Impacts. Localized, short-term adverse impacts on surface and sub-surface soils could result from construction activities associated with some of the past, current, and reasonably foreseeable actions planned or approved within the park. Past projects that contributed to adverse impacts on soils include *Parkwide Emergency Road Repairs, Wawona Road Rehabilitation,* and *Reconstruct Critically Eroded Sections of El Portal Road*. These projects would also result in localized, long-term beneficial impacts by improving drainage and decreasing soil erosion. Present work that has the potential to affect geology and soils includes planned tree removal of moderate to large conifers at several scenic vistas in the Bridalveil Fall area. No future or foreseeable projects within the park could affect geology and soils.

When combined with the impacts under Alternative 3, cumulative impacts on geology and soils would be adverse in the short-term and beneficial in the long-term.

VISITOR EXPERIENCE AND RECREATION

Affected Environment

Bridalveil Fall is one of the most popular attractions within Yosemite National Park (NPS 2009). Bridalveil Fall is often the first waterfall visitors see when entering Yosemite Valley and the area offers a spectrum of opportunities for recreation, including hiking, sightseeing, photography, and nature study. This resource considers the experience of visitors to the Bridalveil Falls area in terms of the availability of diverse viewing and trail options, accessibility for all park visitors, crowding, visitor density, safety, and adequate restrooms. It also considers traffic congestion for private vehicles, tour buses, and NPS shuttle buses.

Over five million people visited Yosemite National Park in 2016 (NPS 2016). About 52% of the park's visitors visit the base of Bridalveil Fall per a 2009 summer visitor use study (NPS 2009). Peak flows at Bridalveil Fall occur in spring and early summer, and visitation to the area generally reflects the size of the waterfall. Comments on the poor condition and wait times at the low-functioning vault toilets at the parking area are a common complaint letter received in the park.

EXISTING COMFORT STATION AT BRIDALVEIL FALL

The paved trail to the viewing platform at the base of the waterfall from the Bridalveil Fall parking area follows a historic carriage road for about half of the route. The final part of the trail is not fully accessible (Architectural Barriers Act [ABA]-compliant) due to its steep grade as one approaches the viewing platform. Another visitation access point for Bridalveil Fall is Bridalveil Straight. Based on 2017 visitor experience data, the majority of the use on Bridalveil Straight is to view El Capitan. Visitors also stop on Bridalveil Straight to orient themselves to this entry into Yosemite Valley, take a break, or hike to the Merced River. The trail from Southside Drive at Bridalveil Straight that connects to the trail to the viewing platform is not paved.

The trails in the Bridalveil Fall area are often busy and the viewing platform is often crowded during times of peak visitation. The *Merced River Plan* determined a standard for visitors on the viewing platform of 20 square feet per person during the busiest hours of the day on the busiest days of the year (NPS 2014a). Based on a July 2017 study that evaluated visitor volumes and characteristics between the hours of 10:00 a.m. and 4:00 p.m., the average number of people arriving to the viewing platform area per hour was 630, with a maximum of 800 and a minimum of 437 (Hockett 2017). The average number of people on the platform at one time was 36 (approximately 11 square feet per person). Tour bus visitors tended to arrive within minutes of each other, causing congestion on the platform (Hockett 2017). Parking in unsanctioned areas in the parking lot and along roadways likely contributes to congestion during the busiest visitation times of the year. At lower water levels, many visitors to the Bridalveil Fall platform explore the boulders around the platform area and up to the waterfall. The boulders are slippery and accidents occur regularly.

CROWDED VIEWING PLATFORM

VISITORS CLIMBING ON BOULDERS NEAR VIEWING PLATFORM

Traffic congestion is an important consideration for park visitors. The majority of visitors to the park travel by private vehicle (88%), while 10% travel by bus service or commercial tour/school bus and 2% travel using the Yosemite Area Regional Transportation System. Bus transportation within the park includes public transportation, charter and tour bus operators, concessionaire-operated tours, and NPS shuttle bus services. Currently, tour buses may park at Bridalveil Straight on either side of the roadway. These parking areas are on a first come first serve basis and shared with private vehicles. As a result, there are often no spaces for buses. Cars attempting to enter the parking lot when it is full frequently backs up traffic on to Wawona Road in both directions, creating large traffic hold-ups. Cars exiting the parking lot and turning left toward Wawona block southbound traffic on Wawona Road. During peak visitation, these situations require the services of traffic management staff to clear traffic in the area.

Environmental Consequences – Methodology

The analysis of impacts to visitor experience is based on whether there would be a complete loss of a recreation opportunity, a change in access to or availability of a recreation opportunity, a change in the quality of visitor experience or recreational opportunities, or a change in safety.

Impacts were evaluated in terms of whether they would be beneficial or adverse to visitor experience. Beneficial impacts would enhance visitor participation and quality of visitor experience. Adverse impacts reduce visitor participation or quality of visitor experience. Impacts can be direct (an immediate result of the action) or indirect (resulting from the action but occurring later in time or removed from the location of direct physical impacts). The duration of an impact considers whether the impact would occur in the short-term (temporary) or over the long-term (permanent).

Environmental Consequences of Alternative 1 – No Action Alternative

Analysis. Under the No Action Alternative, Bridalveil Fall would not be rehabilitated and no repairs would be made with the exception of emergency repairs and routine and periodic maintenance activities. Visitor experience, services, and safety would remain in their current condition. Under the No Action Alternative, visitors would continue to experience low-functioning vault toilets, congestion associated with the parking lot, busy trails, a crowded viewing platform that does not meet the visitor experience standards established in the *Merced River Plan*, a lack of accessible path of travel to the primary viewing platform, and unclear wayfinding. Overall, the No Action Alternative would result in a local, long-term adverse impact on visitor experience.

Cumulative Impacts. All of the past, present, and reasonably foreseeable future actions in Appendix B would likely impart short-term adverse impacts on visitor experience and recreation during initial construction and/or rehabilitation activities. All of the actions would impart more long-term

beneficial impacts on visitor experience and recreation. However, the No Action Alternative would contribute noticeable adverse impacts to overall cumulative impacts.

Environmental Consequences of Alternative 2

Analysis. The rehabilitation of Bridalveil Fall under Alternative 2 would have a local, short-term adverse impact on visitor experience during the construction period due to noise from the construction, increased traffic from construction personnel, and limited access to areas under construction. Construction would avoid the higher visitation period from Memorial Day to Labor Day to the extent possible.

Under Alternative 2, there would be a reduction of private vehicle parking spaces along Bridalveil Straight and an addition of dedicated parking spaces for three tour buses and one shuttle bus. There would be additional parking spaces in the reconfigured parking lot for Bridalveil Fall. To retain existing visitor capacity in west Yosemite Valley per the *Merced River Plan*, parking spaces would be removed along Bridalveil Straight. As most people parking on Bridalveil Straight do not intend to visit the base of Bridalveil Fall, this would shift some use from Bridalveil Straight activities to the Bridalveil Fall area. As more parking is available in the Bridalveil Fall parking lot, there is likely to be a reduction in "non-sanctioned" parking and associated congestion near the entrance to the parking lot during periods of moderate visitation. This would not be the case during peak visitation, as the demand for parking spaces exceeds the supply.

Under Alternative 2, visitor services and experience would be improved at Bridalveil Fall with the addition of a new comfort station with 14 stalls and flush toilets, a new gathering plaza and viewing area to provide room for restroom lines, and benches and interpretative signage. Additionally, the trail system and viewing platforms would be expanded, a new viewing area and additional signage would be added to the northeast and southwest side of Bridge 3, and trees would be removed in select areas to increase the viewshed. The comfort station on Bridalveil Straight would be beneficial to tour bus riders and the majority of the visitors who stop along Bridalveil Straight, providing an additional restroom. The new bridge would provide better pedestrian flow, better views of Bridalveil Fall, and more viewing space to accommodate existing and increased use. Overall, interpretation, wayfinding, and accessibility would be improved.

Under Alternative 2, accessibility would be improved by making the existing trails accessible (with the exception of the existing trail to the viewing platform) through decreasing the grade and paving the Bridalveil Fall Trail. In addition, all of the new trails would be accessible. Safety would be enhanced by decreasing the grade of trails; crosswalks would be added across Bridalveil Straight, commercial tour bus parking would be moved to the south side of Southside Drive and travelers would exit buses to a loading/unloading sidewalk instead of the traffic lane, a clear area that is free from parking and advance warnings would be added in front of the crosswalks, and a pedestrian path would be delineated at the west end of Bridalveil Straight on the south road shoulder. Likewise, traffic would be improved under Alternative 2 with the addition of left and right turn lanes, and the reconfiguration of the parking lot.

Therefore, under Alternative 2 there would be short-term adverse impacts on visitor experience and recreation, and overall long-term beneficial impacts.

Cumulative Impacts. All of the past, present, and reasonably foreseeable future actions in Appendix B would likely impart short-term adverse impacts on visitor experience and recreation during initial construction and/or rehabilitation activities. However, all of the actions would impart more long-term beneficial impacts on visitor experience and recreation. When combined with the short-term adverse impacts and long-term beneficial impacts associated with Alternative 2, cumulative impacts

on visitor experience and recreation would be adverse in the short-term and beneficial in the long-term.

Environmental Consequences of Alternative 3

Analysis. Short-term impacts to visitor experience and recreation under Alternative 3 would be similar to those under Alternative 2, except that construction activities under Alternative 3 would likely take less time under Alternative 2. The rehabilitation of Bridalveil Fall under Alternative 3 would have a local, short-term adverse impact on visitor experience during the construction period due to noise from the construction, increased traffic from construction personnel, and limited access to areas under construction. Construction would avoid the busy season to the extent possible.

Under Alternative 3, there would be a reduction of private vehicle parking spaces along Bridalveil Straight and an addition of dedicated parking spaces for three tour buses and one shuttle bus. There would be additional parking spaces in the reconfigured parking lot for Bridalveil Fall. To retain existing visitor capacity in west Yosemite Valley per the *Merced River Plan*, parking spaces would be removed along Bridalveil Straight. As most people parking on Bridalveil Straight do not intend to visit the base of Bridalveil Fall, this would shift some use from Bridalveil Straight activities to the Bridalveil Fall area. As more parking is available in the Bridalveil Fall parking lot, there is likely to be a reduction in "non-sanctioned" parking and associated congestion near the entrance to the parking lot during periods of moderate visitation. This would not be the case during peak visitation, as the demand for parking spaces exceeds the supply.

Under Alternative 3, there would be a long-term beneficial impact to visitor experience. Visitor services, including restroom facilities, would be improved; crowding on the trails and the viewing platforms would be reduced from the addition of more trails and viewing platforms; congestion in and around the parking lot and along Southside Drive would be improved through the reconfiguration of the parking lot and dedicated tour bus parking; and interpretation, wayfinding, and accessibility would be improved. Bus tour groups would be expected to frequent the viewing platform near Bridge 3 as an alternative to the longer walk to the existing viewing platform. Safety would be enhanced by decreasing the grade of trails, bus parking would be moved to the south side of Southside Road and travelers would exit buses to a loading/unloading sidewalk instead of the traffic lane, a clear area that is free from parking and advance warnings would be added in front of the crosswalks, and a pedestrian path would be added on the south road shoulder along Bridalveil Straight.

Under Alternative 3 there would be fewer trails and viewing platform areas than under Alternative 2, and a second flush toilet would not be added to Bridalveil Straight. As a result, since the number of visitors would be the same under each alternative, crowding on the viewing platforms would be greater and the trails would be busier under Alternative 3. In addition, lines at the comfort stations would be greater under Alternative 3.

Cumulative Impacts. All of the past, present, and reasonably foreseeable future actions in Appendix B would likely impart short-term adverse impacts on visitor experience and recreation during initial construction and/or rehabilitation activities. However, all of the actions would impart more long-term beneficial impacts on visitor experience and recreation. When combined with the short-term adverse impacts and long-term beneficial impacts associated with Alternative 3, cumulative impacts on visitor experience and recreation would be adverse in the short-term and beneficial in the long-term.

PARK OPERATIONS AND FACILITIES

Affected Environment

The Park Operations and Facilities topic evaluates the ability of the park to maintain a safe, functional, and orderly environment as well as provide protection for resources, visitors, and staff. The NPS Visitor Protection Division and Facilities Management Divisions play key operational roles in managing the area.

The Visitor Protection Division performs a range of activities including law enforcement, ranger patrols, preventative and real-time search and rescue, and traffic management during heavily congested periods. Rescue missions at the base of Bridalveil Falls are necessary several times a year. Rescues at the base of the waterfall are extremely difficult to perform due to the inaccessibility of the site for helicopters and sharp, wet, slippery, and steep surfaces to traverse with rescue equipment. The visitor Protection Division also will manage or evacuate areas due to rock fall, tree hazards, and wildfire.

The Facilities Maintenance Division operates and maintains park infrastructure including parking and roads, trails, buildings, water, wastewater, electrical utilities, vault toilets, paved and unpaved trails, hazard tree removal, solid waste and recycling processing and removal, and signs. Facilities Management Division workers with special skills clean and pump vault toilets. Trail workers spend approximately 3 to 4 days a year clearing downed trees and blowing debris off trails in the spring and after high wind events.

Currently, Bridalveil Fall has a number of maintenance backlog issues. The vault toilets at Bridalveil Fall are failing due to inadequate sunlight and a lack of air circulation needed to function properly. The NPS has attempted to correct the problem many times, including installation of the current propane-electric motor venting device, but with little effect.

Environmental Consequences – Methodology

The analysis of park operations and facilities focuses on the ability of the park to perform law enforcement, ranger patrols, and search and rescue activities. It also considers how each alternative affects the need for traffic management and facilities maintenance activities. Impacts were evaluated in terms of whether they would be beneficial or adverse to park operations.

Beneficial impacts would improve operations and/or facilities. Adverse impacts would negatively affect operations and/or facilities, or they could impede the ability to provide adequate services and facilities to visitors and staff. Beneficial impacts represent a decrease in operating costs or management activities. Impacts can be direct (an immediate result of the action) or indirect (resulting from the action but occurring later in time or removed from the location of direct physical impacts). Short-term impacts would be temporary in duration and would be associated with construction, ecological restoration, and transitional activities. A long-term impact would have a permanent effect on operations and facilities.

Environmental Consequences of Alternative 1 – No Action Alternative

Analysis. Under the No Action Alternative, facilities at the Bridalveil Fall area would not be improved with the exception of emergency repairs and routine maintenance activities. Existing facilities would continue to serve the area; however, maintenance issues with the existing vault toilets would continue, trails would not be improved, and the existing trails would not be accessible. Workloads on staff and funding would continue to increase with growing maintenance and repair costs and continuous search and rescue requirements. Therefore, impacts to park operations under the No Action Alternative would be local, long-term, and adverse.

Cumulative Impacts. Localized, short-term adverse impacts and long-term beneficial impacts on park operations would result from all of the past, current, and reasonably foreseeable actions listed and described in Appendix B. Construction projects throughout the park would require short-term additional staff time to manage contracts and construction crews. In the long-term, these projects would reduce maintenance costs and workloads. Alternative 1 would contribute long-term adverse cumulative impacts to park operations.

Environmental Consequences of Alternative 2

Analysis. Under Alternative 2, there would be local, short-term adverse impacts to park operations due to additional staff time needs for contract management, visitor and resource protection, communication, and management of construction crews. Operations within the Bridalveil Fall area would be temporarily affected by construction activities, including closure of parking areas, trail routes, and road closures.

There would be local, long-term beneficial effects resulting from the reduction of maintenance time and effort needed to pump and maintain the existing vault toilets at the parking lot, as these toilets would be replaced with flush toilets. The park's current sewage treatment plan would have the capacity to handle the additional sewage generated from the proposed flush toilets. Re-paving trails and the parking lot, and raising the parking lot above flood level would reduce the need for ongoing repairs. The addition of safety railings at the current viewing area as well as the reduced grade of the trails would potentially decrease the need for search and rescue operations.

There would be local, long-term adverse impacts to park operations particularly due to the installation of the bridge across Yosemite Creek. Although the bridge is planned to be constructed above high water flows, there may be a significant need for maintenance and repair activity during high water flow to clear woody debris from bridge abutments, and there is the potential for large woody debris and frazzle ice (during winter) to cause damage and increase maintenance costs for the bridge. An additional flush toilet along Bridalveil Straight would require additional cleaning and light maintenance crews. Additional trails, including elevated pathways and boardwalks would require additional staff time and funding for maintenance. There would be more upkeep and higher skilled labor needed for maintenance of power, pumps, and water tanks associated with the new comfort stations.

WOODY DEBRIS BUILDUP ON BRIDALVEIL CREEK

Cumulative Impacts. Localized, short-term adverse impacts and long-term beneficial impacts on park operations would result from all of the past, current, and reasonably foreseeable actions listed and described in Appendix B. Construction projects throughout the park would require short-term additional staff time to manage contracts and construction crews. In the long-term, these projects would reduce maintenance costs and workloads. Alternative 2 would contribute long-term adverse cumulative impacts to park operations.

Environmental Consequences of Alternative 3

Analysis. Under Alternative 3, there would be local, short-term adverse impacts to park operations due to additional staff time needs for contract management, visitor and resource protection, communication, and management of construction crews. Operations within the Bridalveil Fall area would be temporarily affected by construction activities, including closure of parking areas, trail routes, and road closures.

Adverse impacts to park operations under Alternative 3 would be expected to be less than that of Alternative 2 since there would not be a second comfort station at Bridalveil Straight or construction of a bridge across Bridalveil Creek. Beneficial impacts would result from the elimination of time and effort required to pump the existing vault toilet at the parking lot. The park's current sewage treatment plan would have the capacity to handle the additional sewage generated from the proposed flush toilets. Re-paving trails and the parking lot, and raising the parking lot above flood level would reduce the need for ongoing repairs. The addition of safety railings at the current viewing area as well as the reduced grade of the trails would potentially decrease search and rescue operations.

There would be local, long-term adverse impacts to park operations due to the installation of additional trails, flush toilets, and the elevated pathways and boardwalks and associated staff time and funding required for maintenance. There would be more upkeep and higher skilled labor needed for maintenance of power, pumps, and water tanks associated with the new comfort stations. Although traffic management needs may decrease due to the additional entrance to the parking area and the addition of the right-hand and left-hand turning lanes, traffic management would still be needed during peak visitation.

Cumulative Impacts. Localized, short-term adverse impacts and long-term beneficial impacts on park operations would result from all of the past, current, and reasonably foreseeable actions listed and described in Appendix C. Construction projects throughout the park would require short-term additional staff time to manage contracts and construction crews. In the long-term, these projects would reduce maintenance costs and workloads. Alternative 3 would contribute long-term adverse cumulative impacts to park operations.

CULTURAL RESOURCES

The following analysis of all three alternatives is intended to meet the purposes of NEPA. Appendix F provides a standalone NHPA Section 106 analysis for Alternative 3 (preferred alternative) to facilitate Section 106 consultation.

Built Environment (Historic Structures and Landscapes)

Affected Environment. The area of potential effects (APE) for this project extends along Southside Drive from Pohono Bridge through Bridalveil Straight, a distance of approximately 6,500 feet, and includes the area from Southside Drive up to Bridalveil Fall along the base of the talus slope. The western boundary for the APE includes approximately 400 feet of the Wawona Road and its intersection with Southside Drive (Figure 3-4). The vertical APE extends approximately 4 to 6 feet below surface to encompass the trenching associated with the potential utility corridor (approximately 4 feet deep) and the manholes (between 5 and 6 feet deep).

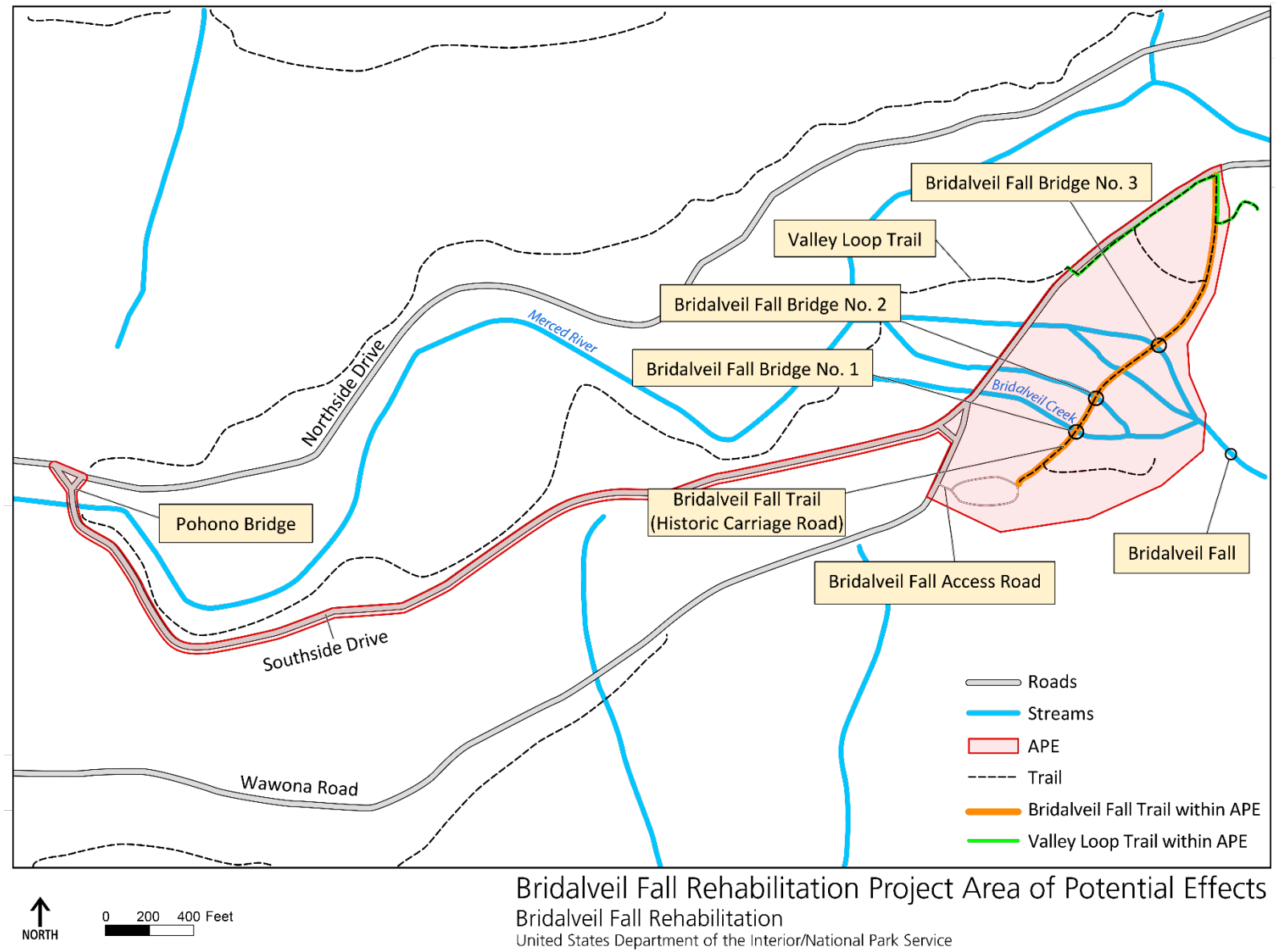


Figure 3-4. Bridalveil Fall Rehabilitation Project Area of Potential Effects

The APE is located in the southwestern portion of the Yosemite Valley Historic District, which is a single, contiguous district that extends roughly from Pohono Bridge on the west to Mirror Lake and Vernal Fall to the east, and from the base of the valley walls from the north to the south. This district includes documentation of landscape characteristics including natural systems and features, spatial organization, vegetation, circulation, land use, views and vistas, historic buildings and structures, and sites, which collectively make up the historically significant cultural landscape of Yosemite Valley (Carr et al. 2006). Bridalveil Fall is near the west end of the district, and is one of the major defining natural features that form the granite cliff setting for the Valley.

The Yosemite Valley Historic District was entered into the National Register of Historic Places (NRHP) in December 2006. The district possesses a national level of significance in the areas of politics/government, transportation, entertainment/recreation, and conservation under Criterion A, and a national level of significance in the areas of landscape architecture, architecture, and community planning and development under Criterion C. The period of significance of the Yosemite Valley Historic District is 1855–1942.

The following is a detailed description of the built environment in the Bridalveil Fall area. Specifically, the discussion focuses on the natural systems and features, historic structures, and views and vistas that would be affected by the implementation of the Bridalveil Fall Area Rehabilitation Project.

Natural Systems and Features — Bridalveil Creek runs through a hanging valley, forming the dramatic 617-foot single drop Bridalveil Fall. The Merced River and its tributaries, including Bridalveil Creek, are natural systems that contribute to the significance of the Yosemite Valley cultural landscape (Carr et al. 2006; Land and Community Associates 1994). The Merced River and its tributary corridors have historically shaped the human environment of Yosemite Valley, physically defining the character of the valley landscape.

Bridalveil Fall is among the important natural features of the valley scenery that have directly influenced the pattern of development and human activity in Yosemite Valley since the mid-19th century. Although Yosemite Valley's granite cliffs and waterfalls are outside the historic district boundary, Bridalveil Fall is important to the setting of the historic district as well its overall significance and integrity (Carr et al. 2006).

Historic Structures — Contributing structures of the Yosemite Valley Historic District in the Bridalveil Fall project area include Pohono Bridge, Southside Drive, Valley Loop Trail, Bridalveil Fall Access Road, Bridalveil Fall Trail, and Bridalveil Fall Bridges Numbers 1–3. Non-contributing structures include the Bridalveil Fall parking area, the comfort station, the Bridalveil Fall viewing platform, and the hardened path from Bridalveil Fall Trail to the viewing platform.

Pohono Bridge was first listed in the NRHP as part of the 1977 Yosemite Valley Bridges nomination. It is also a contributing structure within the Yosemite Valley Historic District. Pohono Bridge is a reinforced concrete, semielliptical arch structure faced with native granite laid in an uncoursed rubble pattern. Wedge-shaped, rock-faced stones line the curve of the arch on both side walls of the bridge. The 32-foot-wide bridge spans 80 feet across the Merced River at the beginning of El Portal Road. It is one of eight concrete arch road bridges built in the Valley between 1922 and 1933; the NPS built Pohono Bridge in 1928. The stone spandrel walls of rough quarried granite reflect the Rustic Style developed by the NPS in the 1920s and 1930s to blend these structures with the natural environment (Wilson 1976).

Southside Drive follows sections of a carriage road around Yosemite Valley that was completed in 1882. The loop road was first paved in 1909, and culverts were installed a year later beneath stretches of Southside Drive. The NPS designed the present day Yosemite Valley Loop Road (Southside and Northside Drives) in 1938. Major floods in 1938, 1950, and 1997 necessitated repaving sections of the road and major repairs to road structures (e.g., bridges, culverts, shoulders) (NPS 2005a).

Southside Drive is a two-lane asphalt road with no shoulders and occasional turnouts. Both lanes carry one-way traffic. Over time, the NPS has provided parking to view both El Capitan and provide overflow access to the falls on the side of the road. An NPS survey in 2005 identified 71 culvert headwalls as character-defining features that contribute to the significance and historic character of the road corridor throughout the Valley (NPS 2005b). None of the contributing culvert headwalls is located in the Bridalveil Fall project area. The road generally follows the 1938 curvilinear horizontal alignment and maintains minimal cut and fill slopes to blend in with the surrounding landscape. Non-historic treatments or repairs of pavement or individual structural features do not diminish the historic character of the road.

The Valley Loop Trail is a contributing structure within the Yosemite Valley Historic District. The trail dates from the late 1920s, and is one of the primary trails originating in the Valley. It was originally built as a bridle trail, generally aligned along existing circulation routes. In 1928, the NPS added 13 miles to the Valley Loop Trail, requiring the construction of 14 bridges. By the early 1930s, construction of most of the bridle trails in the Valley was complete (Fox and Shaw 1998). Today, the Valley Loop Trail is approximately 21 miles long and includes the entire remaining bridle trail system in the Valley (Carr et al. 2006). The trail follows the historic alignment and the majority of its associated features are intact.

Bridalveil Fall Access Road consists of the two-lane entrance from Wawona Road (1933) to the loop parking area at Bridalveil Fall. The access road is asphalt and has no shoulder. The NPS likely constructed the access road in 1935 along with the new Bridalveil Fall looped parking area (NPS 1934, 1935). The access road follows the historic alignment and is in good condition.

Bridalveil Fall Trail follows the alignment of a carriage road built by the U.S. Cavalry, which managed Yosemite National Park from 1890–1914. The trail extends from the Bridalveil Fall parking area to Southside Drive, a distance of approximately 0.4 mile. The majority of the trail is paved with asphalt; however, the portion of the trail from Bridalveil Fall Bridge Number 3 to Southside Drive is dirt, lined with stones. A wider layer of paving is evident underneath the southwest end of the existing trail. Mortared stone gutters are located near the southwest end of the trail. The stone gutters may date to 1935 when the old carriage road was narrowed to 8 feet to convert it into a footpath from the newly built Bridalveil Fall parking area to Bridalveil Fall (NPS 1934, 1935). Sections of the trail near Bridalveil Fall Bridges Numbers 2 and 3 are built on fill and retained by dry-laid, uncoursed, granite walls. The Bridalveil Fall Trail is in good condition.

Along the Bridalveil Fall Trail, at the foot of Bridalveil Fall, are Bridalveil Fall Bridges Numbers 1–3. Each bridge is a reinforced concrete arch structure filled with earth and faced with stone. The spandrel walls, built of granite set in a coursed rubble pattern with mortar, include 2-foot-high guard walls terminating in cut stone end posts. Dry-laid granite wing walls with cement caps extend along the approaches to all three bridges. Bridalveil Fall Bridges Numbers 1 and 3 have a single, 20-foot span, and Bridalveil Fall Bridge Number 2 consists of two, 20-foot spans resting on a central pier. Each span is 18 feet wide (Quin 1991). The east approach to Bridge Number 3 consists of four full-width stone steps. The NPS built the existing set of steps in 1998 after the 1997 flood (NPS 2013). It is unclear when the steps that existed prior to the flood were built. A 1991 photo of Bridge Number 3 indicates the east approach consisted of three steps of compacted soil lined with stones (Quin 1991).

The U.S. Cavalry contracted for the construction of Bridalveil Fall Bridges Numbers 1–3 on a carriage road below Bridalveil Fall in 1913 including the spandrel walls and the roadway (Quin 1991). The Historic American Engineering Record (HAER) documented Bridalveil Fall Bridges Numbers 1–3 as part of the Yosemite National Park Roads and Bridges (CA-117). The HAER report identifies the Bridalveil Fall Bridges Numbers 1–3 (CA-91 through CA-93) are significant for being among the last extant park structures built under the auspices of the U.S. Cavalry (1890–1914), and as representatives of the first use of reinforced concrete in bridge construction in Yosemite National

Park (Quin 1991). One of the pylons on Bridge Number 1 is missing, but no other major deterioration is evident.

BRIDGE 3

Views and Vistas — Views and vistas to natural features like Bridalveil Fall are also historically significant components of the Yosemite Valley Historic District. Two vistas identified in the historic district NRHP nomination as contributing to defining the character of the cultural landscape in Yosemite Valley include the view from Northside Drive looking to Bridalveil Fall and the view from the pull-off on Southside Drive to Bridalveil Fall and Leaning Tower (Carr et al. 2006). Refer to the Scenic Resources section for the analysis of impacts to additional views beyond those included in the Yosemite Valley Historic District nomination.

Environmental Consequences.

Methodology — The potential effects of implementing the No Action Alternative and each action alternative on Bridalveil Fall were assessed by applying the criteria of adverse effect, which are contained in the Federal regulations for implementing NHPA Section 106 [36 CFR 800.5(a)(1)]. In accordance with these criteria, an adverse effect occurs when an action alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for listing in the NRHP by diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association. An adverse effect may also include reasonably foreseeable effects caused by the alternatives that would occur at a later time or that would be cumulative over the course of time.

Under Federal regulations, the assessment of effect of a proposed action on NRHP-eligible cultural resources will result in a determination of no historic properties affected, no adverse effect, or adverse effect. A determination of no historic properties affected occurs when there are no historic properties present, or the action will have no effect on historic properties. A determination of no adverse effect means that there is an effect, but the effect would not diminish characteristics of a cultural resource that qualify it for inclusion in the NRHP.

The effects of the proposed actions on the built environment at Bridalveil Fall were analyzed qualitatively, based on modifications that would be made to character-defining features (features

that qualified the property for inclusion in the NRHP as a contributing resource to the Yosemite Valley Historic District).

Environmental Consequences of Alternative 1 – No Action Alternative.

Analysis — In general, past development, operation, and maintenance of facilities throughout Yosemite National Park have protected and preserved the integrity of historic resources affected by this project. Cumulative impact analysis focuses on those historic resources affected by this project including the Bridalveil Fall access road, Bridalveil Fall trail (carriage road) and the three carriage road bridges in conjunction with past present and future projects. Other affected historic resources include Southside Drive, Pohono Bridge and the historic views of the fall from the Valley View pullout and Southside Drive in the vicinity of the fall. For the purpose of cumulative affects analysis, the NPS has identified past projects that may have affected these historic resources since completion of the Yosemite Valley Historic District National Register nomination, which established the historic status of these resources in 2006. For the Pohono Bridge, historic structure status was established in the Yosemite Valley Bridges National Register nomination (1977). Affects to the trail and carriage road bridges since 2006 have been limited to standard trail/bridge maintenance, which is completed on an as-needed basis to address the high visitor use of the area and any damage from winter storm events. No changes to the historic carriage road alignment or its associated features have been made since completion of the nomination in 2006. Previous work along Southside Drive has not affected the historic alignment of Southside Road and has typically focused on addressing parking issues in the immediate vicinity of the fall and for the El Capitan viewing area. Likewise, the Pohono Bridge, a contributing structure to both the Yosemite Valley Historic District (2006) and the Yosemite Valley Bridges (1977) National Register nominations has received regular maintenance including minor damage repairs following the 1997 flood. Continued tree growth in the historic viewing areas along Southside Drive and the Valley View pullout is addressed through implementation of the scenic vista management actions.

Cumulatively, these projects, when combined with the No Action Alternative, would result in no adverse effect on the Yosemite Valley Historic District or the Yosemite Valley Bridges. These past projects have improved existing facilities and provided needed maintenance and repair of the roads, trails, and bridges.

Current and reasonably foreseeable actions that would have a cumulative effect on the Yosemite Valley Historic District include ongoing maintenance and repair of the Yosemite Valley Loop Road and implementation of the Scenic Vista Management Plan. The maintenance and repair of culverts and other historic elements of the Yosemite Valley Loop Road has been, and will continue to be, carried out in accordance with *A Sense of Place: Design Guidelines for Yosemite National Park (*NPS 2011a*)* and the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Implementation of a program of scenic vista activities will result in the protection and restoration of historic vistas and important viewing areas in the Yosemite Valley. Therefore, these projects/activities in conjunction with the No Action Alternative would result in no adverse effect on the Yosemite Valley Historic District or the Yosemite Valley Bridges.

Environmental Consequences of Alternative 2.

Analysis — Alternative 2 would include building two new comfort stations with flush toilets, one next to the Bridalveil Fall parking lot and one at Bridalveil Straight. These new structures would be additional non-contributing features to the Yosemite Valley Historic District. They would not diminish the integrity of the district's setting to the point of an adverse effect, as they would be constructed per Yosemite National Park Design Guidelines (NPS 2011a) (refer to Figure 2-10). Electrical and sewer lines would be installed along existing road alignment and cross Pohono Bridge to connect to existing electrical and sewer lines on Northside Drive. To cross Pohono Bridge, a contributing structure to both the Yosemite Valley Historic District and the Yosemite Valley Bridges

nomination, the lines would be encased within the deck of the bridge. Construction would not adversely affect historic fabric or historic appearance of the bridge, and the utility lines would be encased within the aggregate and asphalt deck, which are not significant character-defining features of the bridge. The electrical and sewer lines would not be visible after construction is completed. Therefore, construction of the electrical and sewer lines would not adversely affect the Pohono Bridge.

Several actions that would occur at Bridalveil Straight under Alternative 2 to improve visitor safety and enhance visitor arrival and site orientation would have the potential to affect Southside Drive, a contributing structure of the Yosemite Valley Historic District. These actions include the relocation of a crosswalk to the Valley Loop Trail, and the additions of a tour bus pullout and loading area and a seasonal shuttle stop. Relocation of the existing crosswalk would not affect the integrity of Southside Drive. Accommodating the tour bus pullout and loading area and seasonal shuttle stop would require widening an approximately 600-foot-long section of Southside Drive. Over time, the NPS provided parking on both sides of the existing road at Bridalveil Straight, so an additional expansion would not alter the overall character of the road in this area. Although the tour bus pullout and loading area would add a new element along Southside Drive, it would not adversely affect the associated significant historic features of the loop road within the Valley.

None of the actions at Bridalveil Straight, as described above, would affect the integrity of the Valley Loop Trail, a contributor to the Yosemite Valley Historic District, as none of its significant historic features would be altered to implement the improvements at Bridalveil Straight.

Under Alternative 2, a new combined entrance and exit with separate exit lanes for right-hand and left-hand turns would replace the existing access road to the Bridalveil Fall parking lot, approximately 150 feet south of the existing access road, to improve roadway safety and ease traffic congestion at the entrance to the parking area. The relocation of the Bridalveil Fall Access Road, a contributing structure of the Yosemite Valley Historic District, has the potential to adversely affect the historic district; however, Yosemite National Park would work with the designer and consult with the State Historic Preservation Office (SHPO) to explore options that would avoid or minimize the effect.

Certain actions associated with the parking lot under Alternative 2 would have the potential to affect the contributing Bridalveil Fall Trail. These actions include widening the trailhead at the parking lot and connecting it to the sidewalk to the visitor plaza, and adding fill at this connection to install a culvert to direct water under the trail. The trailhead hardened surface would incorporate a different paving material to delineate the continuation of the historic alignment of the former carriage road to the parking lot. Although the grade of the trailhead would be up to 18 inches higher, the historic carriage road alignment would be clearly distinguished within the hardened surface of the trailhead; therefore, the Bridalveil Fall Trail would not be adversely affected by the proposed actions.

Under Alternative 2, the unpaved portion of the Bridalveil Fall Trail from Bridalveil Fall Bridge Number 3 to Southside Drive would be hardened with an accessibility acceptable surface. Altogether, the entire trail from the Bridalveil Fall parking lot to Bridalveil Straight would be hardened to 12 feet in width, consistent with existing conditions. In addition, a new viewing area with interpretative signs would be added to Bridalveil Fall Trail at the intersection with the trail leading up to the viewing platform. Although the original carriage road surface material is unknown, the trail would be hardened with an accessibility acceptable surface to accommodate the heavy level of pedestrian use that it receives. To make it appear rustic, a chip-seal surfacing would be applied using gravel that is compatible in color with the surrounding soil. Although not the historic surfacing material, a chip seal surface would still be of similar form and character and would not adversely affect the carriage roads as contributing resources to the historic district. The original alignment of Bridalveil Fall Trail would be retained and no structural features of the carriage road would be adversely affected by implementation of these actions.

The proposed rehabilitation actions to Bridalveil Fall Trail, as described above, would not adversely affect Bridalveil Fall Bridges Numbers 1 and 2. No character-defining features of the bridges, including their reinforced concrete arch spans or stone spandrel and wing walls, would be altered under Alternative 2.

As part of the actions described above for improving Bridalveil Fall Trail, the stone steps at the east approach to Bridalveil Fall Bridge Number 3 would be removed, and the approach graded to meet ABA standards for accessibility. They would remove non-historic elements (the stone steps), and paving the approach would not diminish the integrity of historic materials or character-defining features of the bridge. Meeting ABA standards would have an effect to the vertical alignment of the carriage road; however, the effect would be minor and would not alter the overall character of the road in this area. Meeting ABA standards would not adversely affect the historic carriage road alignments.

Under Alternative 2, some trees and vegetation would be removed to restore historic vistas and expand views of Bridalveil Fall. These actions would have a beneficial impact on the historic views and vistas to Bridalveil Fall within the Yosemite Valley Historic District. However, the new accessible trail and bridge on the east side of Bridalveil Creek may be visible within the view of Bridalveil Fall from the Southside Drive pull-off. Although these structures would be new elements within this historic vista, they would be designed to be in conformance with *A Sense of Place: Design Guidelines for Yosemite National Park* (NPS 2011a).

Alternative 2 would repair and improve the Bridalveil Fall trail system, provide safe, accessible paths of travel and viewing areas, improve site orientation, and improve parking efficiency. However, it has more potential to impact historic structures when compared to Alternative 3. In particular, the replacement of the Bridalveil Fall Access Road with a new combined entrance and exit road approximately 150 feet to the south has the potential to alter, directly and indirectly, characteristics of the Yosemite Valley Historic District that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Yosemite National Park would consult with the SHPO and work with the designer to explore design options that would avoid or minimize the effects to historic properties. If the relocation of the Bridalveil Access Road were determined to be an adverse effect, Yosemite National Park would work with the State Historic Preservation Office to manage the existing historic segment of the access road in a way that avoided an adverse effect to the Yosemite Valley Historic District.

Alternative 2 would not adversely affect the Pohono Bridge as a contributing structure to the Yosemite Valley Bridges nomination.

Cumulative Impacts — The list of past, present, and reasonably foreseeable projects and plans that may affect the Yosemite Valley Historic District and the Yosemite Valley Bridges is the same as under the No Action Alternative.

When the effects of Alternative 2 are combined with those of past, current, and reasonably foreseeable projects and plans, there would no adverse effect to either the Yosemite Valley Historic District or the Yosemite Valley Bridges historic district.

Environmental Consequences of Alternative 3.

For an evaluation of effects to historic properties under Alternative 3 in accordance with Section 106 of the NHPA, please refer to Appendix F.

Archeological Resources

Affected Environment. The APE for the Bridalveil Fall project extends from Southside Drive up to Bridalveil Fall along the base of the talus slope. The western boundary for the APE includes

approximately 400 feet of Wawona Road and its intersection with Southside Drive (Figure 3-3). The APE also includes the potential utility corridor that would extend from the new comfort station up towards Southside Drive heading west for approximately 6,500 feet, and ending at Pohono Bridge. The trenching associated with the potential utility corridor would be approximately 4 feet deep and the manholes would be between 5 and 6 feet deep. Most of the trenched soil is approximately 75 percent or more of fill and the other 25 percent or less would be within native soils. Directional drilling may be used rather than trenching for the utility corridors.

Eight archeological sites are located within the APE for this project. Seven of these sites are listed in the NRHP as contributing elements of the Yosemite Valley Archeological District, listed in the NRHP in 1978. The Yosemite Valley Archeological District occupies an area of approximately 6,400 acres and contains 107 archeological sites. The archeological sites within the project area that are listed as contributing elements to the Yosemite Valley Archeological District are documented due to their ability to provide information on settlement pattern, social organization, use of natural resources, past ecosystems, subsistence, trade systems, and ethnography, as well as their ethnic affiliation with traditionally associated American Indian peoples (Anderson and Morehead 1978). One site was excavated and subsequently recommended as non-contributing to the Yosemite Valley Archeological District in 2006. One site was documented after the Yosemite Valley Archeological District was listed in the National Register of Historic Places and was therefore not included in the original nomination form. Four sites in the APE have undergone subsurface investigations. The NPS has not performed formal excavations at the other four sites.

Several archeological surveys, archeological monitoring, and excavation projects have been carried out at the Bridalveil Fall area since the mid-1970s. Yosemite National Park undertook additional comprehensive archeological research in 2014-15 and 2017 to better understand the nature and extent of the sites in the area, with an eye toward future rehabilitation of the area under this project.

Due to the sensitive nature of the archeological site information, detailed summaries regarding historic properties are not provided in this public document. All of the documented sites are significant and have integrity to yield important information about the past occupations of the area. The cultural resources are protected by various federal regulations including the National Historic Preservation Act and the Archeological Resources Protection Act. Many of the sites are subjected to disturbance and degradation due to visitor use of the Bridalveil Fall area. During the planning and design of new development, appropriate measures would be taken to assure that no adverse effects to historic properties would occur.

Ethnographic Resources

Affected Environment — Four archeological sites within the APE have been determined to be associated with two ethnographic resources. Merriam first documented these sites in 1917 as specifically named American Indian villages (Merriam 1917).

Black oaks are traditional cultural resources within the APE. Native inhabitants of Yosemite Valley used its abundant plant resources, including nuts, roots, seeds, and berries. Acorns, in particular, were an important plant food used by the Indians of Yosemite (Hull and Kelly 1995).

Four traditional use areas are located within the APE. Local tribes used these areas as starting points for gathering resources. Tribal members would start at these locations and move outward in search of hemp, snakeroot, mushrooms, and other fungus (NPS, Thorsgard, pers. comm., 2017c). The hemp fibers were used to make bird snares, rabbit nets, bags, carrying straps, ropes, and ceremonial regalia, and for wrapping on the handle of soaproot brushes and string for making necklaces. Snakeroot was used as an antidote for snake bites. The root was chewed and then applied to the bite. Tribal members would also place the root in a small cloth bag and carry it with them while they were walking to deter a confrontation with a rattlesnake. Mushrooms and other fungi were the most

regularly gathered items by the local tribes in the Valley. Special care was taken when the local tribes collected white mushrooms. After the mushroom was cut off the stem, the remaining stem was covered back over with the soil and forest floor compost to ensure that the plant would continue to live. While collecting tree mushrooms from alder trees, the fungus was cut within an inch or two from the base so that the fungus would grow back quickly and not die. Mushrooms were usually parboiled, drained, sliced, and cooked with the left over juice and grease from beef they had previously cooked. Sometimes, they were dried in the sun for later use (Bibby 1994).

Two Tribal spiritual areas are located near the Bridalveil Fall. These two areas are highly sensitive to the traditionally associated tribes and groups of Yosemite National Park and will not be described any further. For more information on American Indian consultation for this project, please refer to Appendix F.

Environmental Consequences.

Methodology — The potential effects of implementing the No Action Alternative and each action alternative on Bridalveil Fall were assessed by applying the criteria of adverse effect, which are contained in the Federal regulations for implementing NHPA Section 106 [36 CFR 800.5(a)(1)]. In accordance with these criteria, an adverse effect occurs when an action alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for listing in the National Register by diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association. An adverse effect may also include reasonably foreseeable effects caused by the alternatives that would occur at a later time or that would be cumulative over the course of time.

Under Federal regulations, the assessment of effect of a proposed action on NRHP-eligible cultural resources will result in a determination of either no historic properties affected, no adverse effect, or adverse effect. A determination of no historic properties affected occurs when there are no historic properties present, or the action will have no effect on historic properties. A determination of no adverse effect means that there is an effect, but the effect would not diminish, in any way, characteristics of a cultural resource that qualify it for inclusion in the NRHP.

The effects of the proposed actions on archeological and ethnographic environment at Bridalveil Fall were analyzed qualitatively, based on modifications that would be made to character-defining features (features that qualified the property for inclusion in the NRHP as a contributing resource to the Yosemite Valley Archeological District).

Archeological Resources. All eight archeological sites have the potential to be affected by the project. These archeological sites include the following types of features: rock art, bedrock milling features, rock shelters, lithic scatters, depressions, and rock arrangements. The artifacts present at these same five sites include beads, diagnostic historic artifacts, scrapers, and pestles. Potential impacts to these contributing resources are evaluated based on the evaluation and/or assessment of effects using the criterial for adverse effects to the resources. The subject undertaking is a Category 3 action, where identification, evaluation, and assessment of effects remain to be determined. Consultation for Category 3 actions occurs under the standard review process per 36 CFR Part 800. Curtis (2015) completed the identification effort, where surface inventory and site documentation were completed.

Ethnographic Resources. For purposes of analyzing potential impacts to ethnographic resources, evaluations of how implementation of the alternatives may affect a character-defining pattern or feature of the NRHP-eligible cultural landscape or as historic properties of traditional and religious importance are considered in the determination of effects.

Environmental Consequences of Alternative 1 - No Action Alternative.

Analysis — There would be no effect on the Yosemite Valley Archeological District, individual archeological sites, or ethnographic resources in the APE under the No Action Alternative. Under

the No Action Alternative, visitor facilities or services below Bridalveil Fall would not be rehabilitated or repaired and no repairs would be made with the exception of emergency repairs and routine and periodic maintenance activities. The existing comfort station with vault toilets would not be replaced with a new comfort station with flush toilets, so no trenches for new sewer or electrical lines would be excavated.

The No Action Alternative would not affect the archeological or ethnographic resources within the APE because no vegetation would be removed and the existing structures and features in the Bridalveil Fall area would remain largely unaltered from their existing state.

Under the No Action Alternative, the existing infrastructure in the Bridalveil Fall area would remain, and no new trails would be constructed. Therefore, there would be no new impacts to the Yosemite Valley Archeological District, individual archeological sites, or ethnographic resources under the No Action Alternative. Existing use of area would continue to allow increased degradation of archeological sites and areas of cultural sensitivity due to off-trail use.

Cumulative Impacts — Past projects with the potential to cause ground disturbance in the Yosemite Valley Archaeological District include the restroom installation at the Church Bowl Picnic Area in Yosemite Valley, Bridalveil Fall vault toilet ventilation and interior lighting system installation, reconstruct critically eroded sections of El Portal Road, parkwide emergency road repairs, and Wawona Road rehabilitation. Current projects with the potential to cause ground disturbance in the project area include the rehabilitation of the Yosemite Valley Loop Road. Reasonably foreseeable projects include the replacement of a modular comfort station and construct a new comfort station at Yosemite Village parking areas, and Wawona wastewater treatment system project. Because mitigation measures would be employed to minimize impacts on potentially unidentified and known archeological or ethnographic resources in other proposed and future projects, it is likely that these would protect archeological resources from additional impacts. Therefore, these projects/activities, in conjunction with the No Action Alternative, would result in no adverse effect on the Yosemite Valley Archeological District.

Environmental Consequences of Alternative 2.

Analysis of Archeological Resources — Under Alternative 2, the actions associated with improving roadway safety and traffic congestion at the entrance to the parking area at Bridalveil Fall and improving the parking efficiency of the parking lot have the potential to affect one archeological site. However, the archeological site is located approximately 164 feet from the Bridalveil Fall parking lot. This site is not directly located within the construction footprint associated with improving the parking area at Bridalveil Fall; therefore, there would be no adverse effect to Yosemite Valley Archeological District.

Under Alternative 2, the potential utility corridor extending from the new comfort station north towards Southside Drive and then heading west to Pohono Bridge has the potential to affect two archeological sites, which are bisected by Southside Drive. The prehistoric site consists of a prehistoric lithic scatter and two bedrock milling features covering an approximately 3.5 acre area. The site had been previously excavated and was considered to be in fair condition with disturbance from the construction of Southside Drive, a secondary dirt road, and cut stumps. These disturbances suggested that past tree harvesting, bioturbation, and fire occurred within the site. This site was recommended a non-contributing element to the Yosemite Valley Archeological District given the lack of integrity and lack of data potential to yield information important to our understanding of prehistory; therefore, there would be no adverse effect to the Yosemite Valley Archeological District. The second site is historic and consists of a large borrow pit/rock quarry with an associated can and glass scatter. The site was later revisited and two unidentified borrow pits were recorded as part of this historic site. Two auger lines from the adjacent testing project extended into boundaries of the historic site. No cultural materials were recovered during this subsurface testing. Although the site

has not been evaluated, but is located within the Yosemite Valley Archeological District, the site is probably eligible. Due to the testing data, it was confirmed that the site lacked subsurface artifacts near the vicinity of the road corridor and that the site had been assessed/visited recently with no surface features or scatters near the road. As a result, the proposed utility work will have no adverse effects to the site; therefore, there would be no adverse effect to Yosemite Valley Archeological District.

Under Alternative 2, the proposed paving of the unpaved portion of the Bridalveil Fall Trail that begins at Bridalveil Straight would have no adverse effect to archeological sites. There is one prehistoric site nearby but not located within the construction footprint associated with paving the trail. It is a prehistoric site considered to be in good condition and it covers an approximately 0.08 acre area. Therefore, there would be no adverse effect to the Yosemite Valley Archeological District.

Under Alternative 2, additional trails and viewing areas in the vicinity of the accessible trail to the existing viewing platform would reduce informal trailing, resulting in long-term beneficial impacts. The new bridge that would be constructed from the existing viewing platform across Bridalveil Creek to the east side of Bridalveil Creek would have no adverse effect to archeological sites. There is one prehistoric site nearby but not located within the construction footprint associated with the new bridge. It is a prehistoric site considered to be in good condition and covers an approximately 0.08 acre area. Therefore, there would be no adverse effect to the Yosemite Valley Archeological District.

Analysis of Ethnographic Resources — The four archeological sites that were determined to be associated with two American Indian villages would not be affected by the project under Alternative 2. Only one site has the potential to be affected. However, this site is not directly located within the construction footprint associated with paving the unpaved portion of the Bridalveil Fall Trail that begins at Bridalveil Straight; therefore, there would be no adverse effect to these ethnographic resources.

Black oaks are traditional cultural resources within the APE. However, these trees would not be removed to enhance views of Bridalveil Fall or for any construction-related activities; therefore, there would be no adverse effect to black oaks.

Four traditional use areas are located within the APE. Local tribes used these areas as starting points for gathering resources. Tribal members would start at these locations and move outward in search of hemp, snakeroot, mushrooms, and other fungus (NPS, Thorsgard, pers. comm., 2017c). Yosemite National Park is currently consulting with the seven Tribes that have ties to this area (see Chapter 4 of this document) in order to protect these resources. The two Tribal spiritual areas located near the Bridalveil Fall would be affected by the proposed action. The new bridge across Bridalveil Creek would impact the viewshed of an area of cultural significance. Yosemite National Park is consulting with the Tribes in order to explore design options for the new bridge that would avoid or minimize an adverse effect to an area of cultural significance under Alternative 2.

With mitigation and avoidance measures in place, rehabilitation activities under Alternative 2 would not have an adverse effect on the Yosemite Valley Archeological District, individual archeological sites, or ethnographic resources.

Cumulative Impacts — The list of past, present, and reasonably foreseeable projects and plans that may affect the Yosemite Valley Archeological District is the same as under the No Action Alternative. Cumulatively, these projects would result in no adverse effect on the Yosemite Valley Archeological District when combined with Alternative 2. Because mitigation measures were employed to minimize impacts on potentially unidentified and known archeological or ethnographic resources in past projects, it is likely that these would protect archeological and ethnographic resources from additional impacts. With avoidance, mitigation, and monitoring measures in place for present and reasonably foreseeable projects, there would be no adverse effect.

Environmental Consequences of Alternative 3.

Analysis of Archeological Resources — Under Alternative 3, the actions associated with improving roadway safety and traffic congestion at the entrance to the parking area at Bridalveil Fall and improving the parking efficiency of the parking lot have the potential to affect one archeological site. The archeological site is located approximately 164 feet from the Bridalveil Fall parking lot. This site is not directly located within the construction footprint associated with improving the parking area at Bridalveil Fall; therefore, there would be no adverse effect to Yosemite Valley Archeological District.

Under Alternative 3, the potential utility corridor extending from the new comfort station north towards Southside Drive and then heading west to Pohono Bridge has the potential to affect two archeological sites, which are bisected by Southside Drive. One site consists of a prehistoric lithic scatter and two bedrock milling features covering an approximately 3.5 acre area. The site was considered to be in fair condition with disturbances from Southside Drive, a secondary dirt road, and cut stumps. This suggested past tree harvesting, bioturbation, and fire. This site was considered a non-contributing element to the Yosemite Valley Archeological District given the lack of integrity resulting in a loss of data potential and the ability to yield information important to prehistory. Due to the amount of disturbance and the site was considered a non-contributing element, there would be no adverse effect to the Yosemite Valley Archeological District. The second site is historic and consists of a large borrow pit/rock quarry with an associated can and glass scatter. The site was later revisited and two unidentified borrow pits were recorded as part of this historic site. This site was inadvertently tested when two auger lines from an adjacent site extended east into this site boundary. No cultural materials were recovered during this subsurface testing. Although the site has not been evaluated, but is located within the Yosemite Valley Archeological District, the site is probably eligible. Due to the testing data, it was confirmed that the site lacked subsurface artifacts near the vicinity of the road corridor and that the site had been assessed/visited recently with no surface features or scatters near the road. As a result, the proposed utility work will have no adverse effects to the site; therefore, there would be no adverse effect to Yosemite Valley Archeological District.

Under Alternative 3, additional trails and viewing areas in the vicinity of the accessible trail to the existing viewing platform would reduce informal trailing, resulting in long-term beneficial impacts. The expansion of the existing viewing platform and construction of an additional viewing platform close to the existing platform has the potential to affect one archeological site. In addition, paving the unpaved portion of the Bridalveil Fall Trail that begins at Bridalveil Straight would have no affect to archaeological sites. There is one prehistoric site nearby but not located within the construction footprint associated with paving the trail. It is a prehistoric site considered to be in good condition and covers an approximately 0.08 acre area. Therefore, there would be no adverse effect to the Yosemite Valley Archeological District.

Analysis of Ethnographic Resources — The four archeological sites that were determined to be associated with two American Indian villages would not be affected by the project under Alternative 3. Only one site has the potential to be affected. However, this site is not directly located within the construction footprint associated with paving the unpaved portion of the Bridalveil Fall Trail; therefore, there would be no adverse effect to these ethnographic resources.

Black oaks are traditional cultural resources within the APE. However, these trees would not be removed to enhance view of Bridalveil Fall or for any construction-related activities; therefore, there would be no adverse effect to black oaks.

Four traditional use areas are located within the APE. Local tribes used these areas as starting points for gathering resources. Tribal members would start at these locations and move outward in search of hemp, snakeroot, mushrooms, and other fungus (NPS, Thorsgard, pers. comm., 2017c). Yosemite National Park is currently consulting with the seven Tribes that have ties to these areas (see Chapter

4 of this document) in order to protect these resources. The two Tribal spiritual areas located near the Bridalveil Fall would be affected by the proposed action. The new viewing area and trail that are located off Bridalveil Fall Trail would potentially impact the viewshed of an area of cultural significance. Yosemite National Park is consulting with the Tribes regarding this undertaking in order to avoid or minimize an adverse effect to an area of cultural significance under Alternative 3.

Under Alternative 3, a new trail would be constructed from the parking lot towards the Bridalveil Fall viewing platform and would meet the existing trail to form a loop. The trail alignment would be the same as in Alternative 2; however, the loop trail would have less elevated pathways under Alternative 3. The techniques that would be used include suspension of an elevated trail using more traditional construction methods. There are no known archeological sites that contain boulders located within this elevated trail alignment. Tribal members consider the large boulders a significant cultural resource. The Tribes are being consulted with this undertaking; therefore, construction of the elevated trail would not have an adverse effect to significant boulders under Alternative 3.

With avoidance measures in place, rehabilitation activities under Alternative 3 would not have an adverse effect on the Yosemite Valley Archeological District, individual archeological sites, or ethnographic resources.

Cumulative Impacts — The list of past, present, and reasonably foreseeable projects and plans that may affect the Yosemite Valley Archeological District is the same as under the No Action Alternative. Cumulatively, these projects would result in no adverse effect on the Yosemite Valley Archeological District when combined with Alternative 3. Because mitigation measures were employed to minimize impacts on potentially unidentified and known archeological or ethnographic resources in past projects, it is likely that these would protect archeological and ethnographic resources from additional impacts. With avoidance, mitigation, and monitoring measures in place for present and reasonably foreseeable projects, there would be no adverse effect.

CHAPTER 4: CONSULTATION AND COORDINATION

INTERNAL AND PUBLIC SCOPING

Yosemite National Park conducted a 30-day public scoping period for the Bridalveil Fall Rehabilitation Project from April 26, 2017 through May 26, 2017. The NPS provided the following information to the public:

- An electronic newsletter sent on April 17, 2017 to the park's mailing list. The "eblast" announced the public scoping period, the date of the first public meeting, general project information, and a request for public input.
- An electronic press release on April 24, 2017 to area media outlets. The press release announced the public scoping period, the date of the first public meeting, general project information, and a request for public input.
- Public scoping and project information posted on the NPS PEPC website as well as on the park's planning website at https://parkplanning.nps.gov/projectHome.cfm?projectId=72027.
- Several media interviews prior to the scoping meeting.
- Public Open House on May 10, 2017 from 2:30 p.m. to 5 p.m. in the Yosemite Auditorium to inform interested parties about the proposed project and solicit comments that would help the planning team understand the spectrum of concerns, interests, and issues that should be considered in the planning process. The park invited comments by mail, through the PEPC system, and on comment forms that were made available during public scoping meeting.

During the public scoping period, the park received 22 correspondences, generating 77 individual substantive comments. All comments, substantive or non-substantive, received during the scoping period were duly considered and are now part of the decision file for this project. A Value Analysis and Choosing by Advantage workshop was conducted on August 16, 2017 in order to evaluate, rank, and develop alternative recommendations. The workshop team included Yosemite National Park staff, an outside facilitator and consultants.

NHPA SECTION 106 CONSULTATION

Please see Appendix F, *National Historic Preservation Act Assessment of Effect for Site-Specific Actions* regarding Section 106 consultation.

AGENCY CONSULTATION

Consultation with Federal Agencies

U.S. Army Corps of Engineers — The Clean Water Act (Public Law 92-500) requires federal land agencies to consult with the USACE regarding wetlands in the vicinity of proposed projects. The NPS is consulting with the USACE with regard to wetlands delineation and permit requirements necessary to implement proposed actions in the plan in accordance with Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Representatives from the Army Corps visited the Bridalveil Fall project site on September 13, 2017. Yosemite initiated consultation with the USACE in January 2018.

Under Section 404 of the Clean Water Act (33 USC 1344), permit approval is required for projects that may result in the discharge of dredged or fill material into waters of the U.S. The NPS will work with the USACE to obtain any required Section 404 permits prior to implementing the Bridalveil Fall

Rehabilitation Project. The NPS will serve as the lead agency on behalf of the USACE for consultation with the SHPO, as discussed below.

U.S. Fish and Wildlife Service — The Endangered Species Act of 1973, as amended (16 USC 1531 et seq.), requires all federal agencies to consult with the USFWS to ensure any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of federally listed species or critical habitat. The NPS generated a list of federal listed species in the project area from the USFWS website on June 20, 2017, and initiated informal consultation on August 16, 2017. The park requested concurrence with "no effect" or "not likely to adversely affect" determinations on federally listed species in January 2018. The park will obtain concurrence with the park's assessment of effects on federal listed species prior to finalizing the NPS decision document for this EA.

Consultation with State Agencies

State Water Resources Control Board and Central Valley Regional Water Quality Control Boards — The State Water Resources Control Board (SWRCB) and the nine RWQCBs are the regulatory boards within California's Environmental Protection Agency that derive their authority from Section 401 of the Clean Water Act and Section 13020 of the California Water Code.

SWRCB allocates rights to the use of surface water and, along with nine regional boards, is charged with protecting surface, ground, and coastal waters throughout the state. The RWQCB issues permits that govern and restrict the amount of pollutants discharged into the ground or surface water, which includes regulating storm water during construction activities.

Under the Clean Water Act's Section 401, every applicant for a federal permit or license for any activity that may result in a discharge to a water body must obtain State Water Quality Certification that the proposed activity will comply with state water quality standards, if an activity would result in a discharge to a water body. If required, the NPS will obtain all required permits issued by the RWQCB, file appropriate notifications, and prepare a SWPPP in advance of any construction activities.

CHAPTER 5: GLOSSARY AND ACRONYMS

GLOSSARY OF TERMS

Affected environment: Existing natural, cultural, and social conditions of an area that are subject to change, both directly and indirectly, as a result of a proposed human action.

Area of potential effects (APE): The geographic area or areas where an undertaking has potential to affect historic properties. Consider physical, visual, auditory, and atmospheric effects; potential changes in land or building use, change in the setting and potential for neglect.

Archeological resources: Historic and prehistoric deposits, sites, features, structure ruins, and anything of a cultural nature found within, or removed from, an archeological site.

Best management practices (BMP): Effective, feasible (including technological, economic, and institutional considerations) conservation practices and land- and water-management measures that avoid or minimize adverse impacts to natural and cultural resources. Best Management Practices may include schedules for activities, prohibitions, maintenance guidelines, and other management practices.

Critical habitat: The area of land and water with physical and biological features essential to the conservation of federally listed threatened and endangered species and which may require special management considerations or protection.

Cultural resources: The broad category of socio-cultural resources and historic properties that reflect the relationship of people with their environment.

Endangered Species Act (16 USC 1531 et seq.) — An Act which provides a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved and which provides a program for the conservation of such endangered species and threatened species.

Environmental assessment (EA): A public document required under the National Environmental Policy Act that identifies and analyzes activities that might affect the human and natural environment. An EA is considered a concise public document, which provides sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS), aids an agency's compliance with NEPA when no EIS is necessary, and it facilitates preparation of an EIS when one is necessary.

Environmental consequences: This section of an environmental assessment describes the impacts a proposed action would have on resources. Direct, indirect, and cumulative impacts, both beneficial and adverse area analyzed.

Facilities: Buildings, communications support structures, and the associated supporting infrastructure such as roads, trails, and utilities.

Finding of no significant impact (FONSI): A document prepared by a federal agency showing why a proposed action would not have a significant impact on the environment and thus would not require preparation of an environmental impact statement. A FONSI is based on the results of an EA.

Floodplain: A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Historic and cultural resources: Under NEPA, culturally valued pieces of real property (not historic properties) and non-tangible values such as cultural use of the biophysical and built environments, and sociocultural attributes such as social cohesion, lifeways, religious practice and other social institutions (40 CFR 1508.27(b)(3)).

Historic properties: Under NHPA (16 USC 470 et seq.) and NEPA (USC 432 1-4347), a prehistoric or historic district, site, building, structure, object, landscape, or traditional cultural resource to which American Indians attach cultural and religious significance that is listed in, or eligible for listing in, the National Register of Historic Places (NRHP) (36 CFR 800.16(l)(1) 40 CFR 1508.27(b)(8)).

National Environmental Policy Act (NEPA): The federal act that sets national environmental policies and requires preparation of an EIS for major federal actions that may significantly affect the quality of the human environment (USC 432 1-4347).

National Historic Preservation Act of 1966 (16 USC 470 et seq.): An Act to establish a program for the preservation of historic properties throughout the nation, and for other purposes, approved October 15, 1966 [Public Law 89–665; 80 STAT.915; 16 USC 470 as amended by Public Law 91–243, Public Law 93–54, Public Law 94–422, Public Law 94–458, Public Law 96–199, Public Law 96-244, Public Law 96– 515, Public Law 98–483, Public Law 99–514, Public Law 100–127, and Public Law 102–575].

National Register of Historic Places (NRHP): The official list of the nation's historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966, the NPS's NRHP is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources.

National park service management policies: A policy is a guiding principle or procedure that sets the framework and provides direction for management decisions. NPS policies are guided by and consistent with the Constitution, public laws, Executive proclamations and orders, and regulations and directives from higher authorities. Policies translate these sources of guidance into cohesive directions. Policy direction may be general or specific. It may prescribe the process by which decisions are made, how an action is to be accomplished, or the results are to be achieved. The primary source of NPS policy is the publication Management Policies 2006. The policies contained therein are applicable Service-wide. They reflect NPS management philosophy. Director's Orders supplement and may amend Management Policies. Unwritten or informal "policy" and people's various understandings of NPS traditional practices are never relied on as official policy.

National Park Service Organic Act: In 1916, the NPS Organic Act established the NPS in order to "promote and regulate use of parks…" and defined the purpose of the national parks as "to conserve the scenery and natural and historic objects and wild life therein and to provide for the enjoyment of the same in a manner and by such means as will leave them unimpaired for the enjoyment of future generations." This law provides overall guidance for the management of NPS units.

No action alternative: The alternative in an EIS that proposes to continue current management direction. "No action" means the proposed activity would not take place, and the resulting environmental effects from taking no action would be compared with the effects of permitting the proposed activity or an alternative activity to go forward.

Non-native species: Species of plants or wildlife that are not native to a particular area and often interfere with natural biological systems.

Ordinary high water mark: A change in vegetation, impression in the shoreline, or wrack lines approximately corresponding to the two-year flood. In lakes, this can also include areas devoid of vegetation in steep terrain and adjacent to wetlands in areas of low relief.

Riparian areas: The land area and associated vegetation bordering a stream or river.

Riverine: Of or relating to a river. A riverine system includes all wetlands and deepwater habitats contained within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts in

excess of 0.5%. A channel is an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water.

Sediment: A particle of soil or rock that was dislodged, entrained, and deposited by surface runoff or a stream. The particle can range in size from microscopic to cobble stones.

Threatened and endangered species: Species of plants that receive special protection under state and/or federal laws. Also referred to as "listed species," "endangered species," or "special-status species."

Traditional cultural properties: A resource to which American Indian tribes attach cultural and religious significance that is eligible for listing or listed in the NRHP and includes structures, objects, districts, geological and geographical features and archeology. National Register Bulletin 38 provides guidance for identifying and evaluating such properties for eligibility.

Traditional cultural resource: Any site, structure, object, landscape, or natural resource feature assigned traditional, legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it.

Visitor experience: The perceptions, feelings, and reactions a park visitor has in relationship with the surrounding environment.

Watershed: The region drained by, or contributing water to, a stream, lake, or other body of water. Synonym**:** basin or drainage basin.

Wetland: Wetlands are defined by the U.S. Army Corps of Engineers (Code of Federal Regulations, Section 328.3[b], 1986) as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands, as defined by the U.S. Fish and Wildlife Service (often referred to as the Cowardin classification system) and adopted by the NPS, are lands in transition between terrestrial and aquatic systems, where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following attributes: the land supports predominantly hydrophytes, at least periodically; the substrate is predominantly undrained hydric soils; and/or the substrate is saturated with water or covered by shallow water at some time during the growing season of each year.

ACRONYMS

ABA	Architectural Barriers Act
ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effects
BMP	Best Management Practices
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CT	Candidate Threatened
dbh	diameter at breast height

DPS	Distinct Population Segment
E	Endangered
EA	Environmental Assessment
EIS	Environmental Impact statement
FGDC	Federal Geographic Data Committee
FONSI	Finding of No Significant Impact
FP	Fully Protected
HAER	Historic American Engineering Record
MGM2	Money Generation Model 2
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
ORV	Outstandingly Remarkable Values
PEPC	Planning, Environment, and Public Comment
PT	Proposed Threatened
RWQCB	Regional Water Quality Control Board
SHPO	State Historic Preservation Office
SSC	Species of Special Concern
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
T	Threatened
U.S.	United States
USACE	United States Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WL	Watch List

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APPENDIX A
DRAFT WILD AND SCENIC RIVERS ACT SECTION 7 DETERMINATION
BRIDALVEIL FALL REHABILITATION PROJECT

This document evaluates the proposed action (Alternative 3) in the *Bridalveil Fall Rehabilitation Environmental Assessment* (*Bridalveil Fall EA*) in terms of Section 7 of the Wild and Scenic Rivers Act (WSRA), a key provision that aims to protect the free-flowing condition of designated rivers. The authority for this determination is found in Public Law 90-542, as amended, 16 United States Code (USC) 271-1278. WSRA Section 7 requires managing agencies to conduct a rigorous and consistent process to protect the free-flowing condition of the Merced River when a proposed *water resources project*[1] triggers a review.

Two actions under Alternative 3 of the Bridalveil Fall EA would be located within the bed and banks of Bridalveil Creek, a tributary to the Merced Wild and Scenic River. These actions are: (1) enlarge a viewing platform to 1,500 square feet (sq ft), and (2) add a new accessible loop trail from the parking lot to a viewing platform. This document evaluates these actions for their potential to invade the Merced Wild and Scenic River corridor or diminish scenic, recreational, fish, or wildlife values present on the day of designation (WSRA§7(b). These standards apply to tributaries of a wild and scenic river per WSRA§7(b).

PROJECT DESCRIPTION

A complete description of Alternative 3 (Preferred Alternative) is presented in Chapter 2 of the *Bridalveil Fall EA*. The following section summarizes the key features of the preferred alternative within the bed and banks of Bridalveil Creek, a tributary to the Merced Wild and Scenic River.

Actions within the Bed and Banks of Bridalveil Creek

Existing Viewing Platform. The park would expand the existing viewing platform from about 400 sq ft to about 1,500 sq ft to reduce crowding as directed in the *Merced Wild and Scenic River Comprehensive Management Plan Environmental Impact Statement* and *Record of Decision* (*Merced River Plan*)(NPS 2014). Part of the existing platform is located within the bed and banks of Bridalveil Creek (about 175 sq ft) (Figure 2-9 in the *Bridalveil Fall EA*). The existing portion of the platform would be overlaid with smooth material. The overlay would be 4 to 18 inches deep, depending on the contours of the existing platform surface. Bridalveil Creek does not reach the viewing platform at low flows. The new expanded portion of the viewing platform would occur outside of the bed and banks of Bridalveil Creek.

New Accessible Pedestrian Loop Trail. The park would construct a new accessible pedestrian loop trail from the parking lot to a viewing platform (Figure 2-3 in the *Bridalveil Fall EA*). Most of the trail would be located in upland areas. Portions of the pedestrian trail would be elevated to cross an intermittent wetland stream channel and the piers to support the elevated portions would likely need to be placed within the intermittent wetland channel. The park considered options to hang the elevated portions of the trail from nearby boulders rather than install support piers, but rejected the idea because of concerns that the trail would not be compatible with the Yosemite Valley Historic District and Yosemite Design Guidelines (NPS 2011). The park's traditionally associated American Indian tribes and groups also did not support the idea of hanging the trail from boulders. The park

[1] A water resources project is any dam, water conduit, powerhouse, transmission line, or other works project under the Federal Power Act, or other developments, that would affect the free-flowing character of a wild and scenic or congressionally authorized study river. In addition to projects licensed by the Federal Energy Regulatory Commission, water resources project may include dams, water diversions, fisheries habitat and watershed restoration, bridges and other roadway construction/reconstruction projects, bank stabilization projects, channelization projects, levee construction, boat ramps, fishing piers, and activities that require a section 404 permit from the U.S. Army Corps of Engineers (Clean Water Act Section 404).

also considered a completely ground-based trail alternative with causeways through the drainage channel. The park rejected this option was because it would divert natural water flows and direct them through culverts, and a large amount of ground disturbance would be required in a relatively pristine environment.

Actions Outside the Bed and Banks of Bridalveil Creek

Comfort Station and Parking Lot. The existing comfort station with four vault toilets at the parking lot would be replaced with a new comfort station with flush toilets (14 stalls) in the same general area. Utilities to service the comfort station would connect to the main lines at Northside Drive near Pohono Bridge, requiring approximately 1 mile of trenching or directional drilling in Wawona Road/Southside Drive. The northeast end of the parking lot would be raised a maximum of 18 inches and damaged culverts and headwalls would be reconstructed.

The existing parking lot footprint would be reorganized to gain 20 to 24 parking spaces (about 80 total spaces including four accessible spaces). There would be a separate entrance and exit road into the parking lot

Trails, Bridges, and Viewing Areas. Crews would selectively clear trees from new and existing viewpoints to enhance views. All new trails and pathways would be constructed to meet accessibility standards. . The existing trailhead at the parking lot would be moved a short distance to minimize ponding during high water events. A short boardwalk on the east side of the parking lot would be constructed over the drainage area to connect with the new gathering and viewing area.

Bridalveil Straight. The park would designate a commercial tour bus parking area on the south side of Southside Drive between the intersection of Wawona Road and the east end of Bridalveil Straight. This area was formerly ad hoc tour bus and private vehicle parking. A gathering area with views of Bridalveil Fall and El Capitan, approximately 2,700 sq ft in size, would be added on the south side of Southside Drive. Less than 10 trees would be selectively removed to enhance the view of El Capitan.

ANALYSIS

The effects of the proposed water resources actions within the Merced River corridor are outlined in Table A-1.

TABLE A-1 EFFECTS OF PROPOSED WATER RESOURCES ACTIONS UNDER THE PREFERRED ALTERNATIVE (ALT 3)

Expanded Viewing Platform	Elevated Portions of New Pedestrian Trail
Potential for Actions to Invade the Merced Wild and Scenic River	
The new expanded portion of the viewing platform would not extend into the bed and banks of Bridalveil Creek, which is a tributary to the Merced River, but a small portion of the *existing* platform extends into the Bridalveil Creek channel. Creek flows do not reach the existing platform at low flows. During moderate and high flows, the platform would not substantially impact flows in Bridalveil Creek more than the existing boulders and trees in the very rough alluvial fan environment. Impacts to flows of the Merced River would be imperceptible.	The insertion of piers into an intermittent stream channel to support elevated portions of the new pedestrian trail will have no effect on the main Merced River. The channel is part of the braided Bridalveil Creek drainage system that flows during moderate to high flows. Water displacement caused by support piers will be insignificant in Bridalveil Creek as well as the Merced River.
Effects on Scenic Values - Scenic values, as specified for Segment 2B in the *Merced Wild and Scenic River Comprehensive Management* Plan (MRP)(NPS 2014), are views of the world's most iconic scenery, with the river and meadows forming a placid foreground to towering cliffs and waterfalls (ORV 16) (MRP page 5-4) . To protect and enhance scenic values in this river segment, new development should harmonize with its surrounding landscape (MRP pages 5-111 to 5-116).	
The viewing platform would be compatible with the Yosemite design guidelines (NPS 2011) and the surrounding landscape. The expanded viewing platform would not result in reduced viewing quality as it will not silhouette or block views of Bridalveil Fall.	The elevated portions of the new pedestrian trail would be compatible with the Yosemite design guidelines (NPS 2011) and the surrounding landscape. The trail would not would not silhouette or block views of Bridalveil Fall or result in reduced scenic quality.
Effects on Recreational Values – Recreational values in Segment 2B of the Merced River corridor are a wide variety of river-related recreational activities in the Valley's extraordinary setting along the Merced River (ORV 20 Merced River Plan pg. 5-4). In Segment 2B, recreational values include the ability for people of all ages and abilities to immerse themselves in their surroundings and take in the sights, sounds, and feel of the river and its dramatic backdrop (MRP page 5-130). To protect and enhance recreational values, the park must provide for a diversity of high quality river-related recreational opportunities that allow visitors to directly connect with the river and its environs amidst the spectacular scenery of Yosemite Valley (MRP page 5-130). The MRP commits to redesign access and provide less crowded conditions (MRP page 5-138).	
Expansion of the viewing platform will address crowded conditions and high "site displacement values" described in the MRP (page 5-137 to 5-138). Viewing Bridalveil Fall, often surrounded by mist from the fall, embodies the goal of providing recreational opportunities that directly connect with the river and its environs.	Addition of an accessible trail with elevated portions follows direction in the *Merced River Plan* to redesign access and improve crowded conditions in the Bridalveil Fall area (MRP page 5-138). The trail route will allow visitors to immerse themselves and directly connect with the natural beauty of the Bridalveil Fall environment.

TABLE A-1 EFFECTS OF PROPOSED WATER RESOURCES ACTIONS UNDER THE PREFERRED ALTERNATIVE (ALT 3)

Expanded Viewing Platform	Elevated Portions of New Pedestrian Trail
Effects on Wildlife and Fish Values – Wildlife and fisheries values fall under the biological values specified in segment 2B of the Merced River (MRP page 3 5-3). Biological values include the meadows and riparian communities of Yosemite Valley that comprise one of the largest mid-elevation meadow-riparian complexes in the Sierra Nevada (ORV 2)**.**	
Expansion of the viewing platform would have short-term construction related effects on wildlife related to noise and equipment. Mitigation measures would protect Bridalveil Creek from erosion-related issues. In the long-term, the action would not affect the meadows and riparian communities of Yosemite Valley and there would be no riparian resources affected by expansion of the platform.	Construction of elevated portions of a new pedestrian trail would have short-term construction related effects on wildlife related to noise and equipment. The action would not affect the meadows and riparian communities of Yosemite Valley, and riparian resources would not be affected by trail construction. There would be no effect on fisheries as the intermittent channel is completely dry for most of the year with no ponding.

SECTION 7 DETERMINATION

The *Bridalveil Fall EA* includes actions to: (1) enlarge the existing viewing platform to 1,500 sq. feet, and (2) add a new accessible loop trail from the parking lot to the existing platform. These actions are consistent with management goals to protect and enhance the Merced Wild and Scenic River. These actions would not invade the Merced Wild and Scenic River or diminish the scenic, recreational, fish, or wildlife values present on the day of Merced Wild and Scenic River designation.

_____

Superintendent Date

_____

Regional Director Date

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APPENDIX B
MITIGATION MEASURES

The National Park Service places a strong emphasis on avoidance, minimization, and mitigation of impacts. To help ensure that field activities protect natural, cultural, and social resources and the quality of the visitor experience, mitigation measures have been developed. The following section discusses mitigation measures that would occur prior to, during, and after construction of specific management actions.

The majority of the project area is in the Merced Wild and Scenic River corridor (with the exception of the existing viewing platform). This table consists of relevant mitigation measures from the Merced River Plan Final Environmental Statement and Finding of No Significant Impact as well as additional mitigation measures added for this specific project. Added mitigation measures are in italics.

Topic	Mitigation Measure	Responsibility
GENERAL CONSTRUCTION MANAGEMENT MEASURES		
MM-GCM-1 General Construction Management	All Contractor and subcontractor employees shall receive a brief orientation about working in Yosemite National Park and the El Portal Administrative Site prior to performing work. The orientation describes the efforts to be taken by the Contractor and subcontractor employees to protect the natural, cultural, and physical resources of YNP while working on this and other projects. This orientation also describes mitigation and other environmental protection measures that must be adhered to at all times while in the Park. All contractor and subcontractor employees shall view a government provided orientation video to ensure each is fully aware of the natural and cultural resource protection and mitigation requirements of work at YNP, or in the El Portal Administrative Site. Government staff will provide the initial orientation. Subsequent on-going awareness orientation for new employees and when site conditions change shall be performed by contractor and integrated into construction operation procedures. The Contractor shall maintain a manifest tracking all contractor personnel, when they received their orientation training, and when they started work. Contractor personnel shall be field identifiable as having received their orientation training by means of a readily visible sticker on their hard hat. Prior to entry into the park, Contractor shall steam-clean heavy equipment to prevent importation of non-native plant species, tighten hydraulic fittings, ensure hydraulic hoses are in good condition and replace if damaged, and repair all petroleum leaks. Inspect the project to ensure that impacts stay within the parameters of the project area and do not escalate beyond the scope of the environmental assessment, as well as to ensure that the project conforms with all applicable permits or project conditions. Store all construction equipment within the delineated work limits. Contractor shall also confine work areas within creek channels to the smallest area necessary. If deemed necessary, demolition/construction work on weekends or federal government holidays may be authorized, with prior written approval of the Superintendent. Contractor shall remove all tools, equipment, barricades, signs, surplus materials, and rubbish from the project work limits upon project completion. Contractor shall repair any asphalt surfaces that are damaged due to work on the project to original condition. Contractors shall also remove all debris from the project site, including all visible concrete, timber, and metal pieces. The park shall develop a Communications Strategy Plan to alert necessary park and Concessioner employees, residents and visitors to pertinent elements of the construction work schedule. The Contractor shall provide protective fencing enclosures around construction areas, including utility trenches to protect public health and safety.	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
MM-GCM-1 General Construction Management (cont.)	The NPS will apply for and comply with all federal and state permits required for construction-related activities. Contractor and NPS shall implement compliance monitoring to ensure that the project remains within the parameters of National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) compliance documents. Develop an emergency notification plan that complies with park, federal, and state requirements and allows contractors to properly notify park, federal, and/or state personnel in the event of an emergency during construction activities. This plan will address notification requirements related to fire, personnel, and/or visitor injury, releases of spilled material, evacuation processes, etc. The emergency notification plan will be submitted to the park for review/approval prior to commencement of construction activities. Identify locations of existing utilities prior to removal activity to prevent damage to utilities. The Underground Services Alert and NPS maintenance staff will be informed 72 hours prior to any ground disturbance. Construction-related activities will not proceed until the process of locating existing utilities is completed (water, wastewater, electric, communications, and telephone lines). An emergency response plan will be required of the contractor.	
MM-GCM-2 Design	In accordance with the National Park Service's Denver Service Center's Workflows, the standard business practices outlining the requirements for general, predesign, schematic design, design development, and construction documents shall be followed (www.nps.gov/dscw/design.htm)	National Park Service
MM-GCM-3 Construction	In accordance with the most current version of Yosemite National Park's Division 1 Specifications (also referred to as General Requirements for Construction), the standard business practices outlining the requirements for Summary of Work; Seismic Requirements; Definition of Bid Items; Project Meetings; Critical Path Method Construction Schedule; Project Schedules (small and large projects); Submittal Procedures; Submittals; Natural, Cultural, and Physical Resources Protection; Storm Water Pollution Prevention Measures; Accident Prevention; Reference Standards; Contractor Quality Control; Temporary Services and Controls; Field Support Offices; Traffic Control; Product Substitutions and Variations; Material and Equipment Handling and Storage; Field Engineering; Project Closeout; Operation and Maintenance Data; and, System Start, Demonstration and Training shall be incorporated into all construction requirements documents (plans and specifications).	National Park Service
MM-GCM-4 Yosemite National Park Design Guidelines	*A Sense of Place: Design Guidelines for Yosemite National Park* shall be followed to ensure that park facilities are designed to be compatible with the existing resources.	National Park Service
MM-GCM-5 Design Approvals	All final construction documents (plans and specifications) will be approved by the Park Superintendent prior to implementation.	National Park Service
MM-GCM-6 Pre-Construction	In accordance with the National Park Service's Denver Service Center's Workflows, the standard business practices outlining the requirements for a SharePoint Project Website, Permits, Accident Prevention & Blasting Safety Plans, Division 01 Management Plans, Baseline Construction Schedule, the Schedule of Values and the Pre-Construction Conference shall be followed (www.nps.gov/dscw/design.htm).	National Park Service
MM-GCM-7 Construction	In accordance with the National Park Service's Denver Service Center's Workflows, the standard business practices outlining the requirements for Submittals, Coordination, Documentation, Tracking, Modifications, Beneficial Occupancy & Milestone Inspections, Closeout Submittals, and Substantial Completion shall be followed (www.nps.gov/dscw/design.htm).	National Park Service
MM-GCM-8 Post-Construction	In accordance with the National Park Service's Denver Service Center's Workflows, the standard business practices outlining the requirements for the Construction Contractor's Performance Evaluation, Draft Completion Reports (Fixed Assets), and Demobilizing Field Office (s) shall be followed (www.nps.gov/dscw/design.htm).	National Park Service
MM-GCM-9 Pre-Construction and Construction	Design the utility trench and directional drilling to allow subsurface flows to continue unimpeded, without creating an underground dam. Do not allow asphalt as backfill material.	National Park Service
MM-GCM-10 Construction timing	The National Park Service will limit the operating period for construction to daylight hours.	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
SOILS AND GEOHAZARDS		
MM-GEO-1 Soils Management	The Contractor shall confine all earth moving activities to within the work limits as defined in the site plans. The displacement of soil or other materials outside the defined limits shall be approved by the contracting officer. Landscape: Land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area. Topsoil shall be salvaged and placed in a separate location from sub-soils and replaced on top of other soils as the trench is backfilled. The location for stock piling soils and other woody materials shall be approved by the contracting officer. Fungal Pathogens In Soil (Root Rot): Fungal pathogens that have negative impacts on oaks and conifers are present in certain areas in Yosemite Valley. Soil infected with these pathogens shall not be imported into areas that are free of the pathogens. If construction drawings indicate that infected soil is present in the work site, the following procedures must be followed: • Ensure that infected soil is stored within the construction zone. Should infected soils be stockpiled outside of the construction zone, ensure that stockpiles are placed outside of areas that do not have the fungal pathogen. Protect stockpiles of infected soil to prevent transport by wind, water, animal, or human traffic. • Clean equipment buckets and tires or hand tools used in areas containing fungal pathogens before moving to or working in unaffected areas. • Whenever possible, all stumps shall be removed from excavations and disposed of in a legal manner outside of the Yosemite National Park boundary. • Stump treatment when stumps cannot be removed: The treatments following tree removal must be universal throughout the park to avoid inadvertently spreading infection. Eradication of the disease is not possible, but spread can be managed. • Conifers: Treat all stumps (>6 inches in diameter in recreational use areas, >12 inches diameter in undeveloped areas) with Sporax within a few days of felling the tree. If a stump is ground, it must be treated with Sporax, and then covered with soil. If the stump is removed, no chemical treatment is required. Remove all of the root material >3 inches in diameter. Standing trees that have been dead for less than one year must have stumps treated with Sporax once they are removed. • Deciduous oaks should be left whenever possible; if the tree must be cut, the entire stump and root system must be removed from the Park. • Disturb no more than 15 percent of the roots for any given tree. • Do not over-water oak trees. • Do not compact soil within drip lines of the tree. • Treatment of infected soils: Remove root material by sifting or sorting soil before backfilling. • Treatment of soils in an annosus zone. Only infected *Hederobisidion annosum* areas need to be treated for removal of root material. Standard specification for roots to be removed from disturbed soil: >3 inches diameter or >20 inches in length. Remove ALL stumps from excavation. • Do not move soil from infected areas. • Topsoil shall be salvaged and reused in the same place from which it was excavated. If the soil is to be windrowed and used later, it should be sorted for root chunks prior to storage. Conserve and salvage topsoil for reuse. Materials will be reused to the maximum extent possible • All disturbed soil and fill slopes shall be stabilized in a manner consistent with the provisions of Mitigation Measure MM-HYD-1 (see below).	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
HYDROLOGY AND WATER QUALITY		
MM-HYD-1 Stormwater Pollution Prevention Plan	Contractor shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) that designates construction best management practices to be used to control the sources of fine sediment and to capture and filter it before entering the river. The SWPPP shall define the characteristics of the site, identify the type of construction that will be occurring, and describe the practices that will be implemented to control erosion and the release of pollutants in stormwater. At a minimum, the SWPPP shall address the following, as applicable: ***Stabilization Practices*** • The stabilization practices to be implemented shall specify the intended stabilization practices, which may include one or more of the following: temporary seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, erosion control mats, protection of trees, preservation of mature vegetation, etc. On the daily Contractor Quality Control (CQC) Report, the Contractor shall record the dates when the major grading activities occur, (e.g., clearing and grubbing, excavation, embankment, and/or grading); when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated. Unless otherwise directed by the Contracting Officer for the reasons below (i.e., unsuitable conditions or no activity for less than 21 days), stabilization practices shall be initiated as soon as practicable, in any portion of the site where construction activities have temporarily or permanently ceased, but no more than 14 calendar days after the activities cease. • Unsuitable Conditions - Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceases is precluded by unsuitable conditions caused by the weather, stabilization practices shall be initiated as soon as practicable after conditions become suitable. No Activity for Less Than 21 Days - Where construction activity will resume on a portion of the site within 21 days from when activities ceased (e.g., the total time period that construction activity is temporarily ceased is less than 21 days), then stabilization practices do not have to be initiated on that portion of the site by the 14th day after construction activity temporarily ceased. ***Structural Practices*** • The Contractor shall implement structural practices to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Location and details of installation of structural practices shall be depicted on the construction drawings. ***Silt Fences*** • The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading). Silt fences shall be installed in the locations indicated on the drawings or as needed based on Contractor operations. Final removal of silt fence barriers shall be upon approval by the Contracting Officer. Silt fences shall extend a minimum of 16 inches above the ground surface and shall not exceed 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be spliced together at a support post, with a minimum 6-inch overlap, and securely sealed. A trench shall be excavated approximately 4 inches wide and 4 inches deep on the upslope side of the location of the silt fence. The 4-inch by 4-inch trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon approval by the COR. ***Straw Bales*** • Straw bales are not authorized for use in storm water control at YNP. They have the potential to introduce exotic species into the Park environment.	Contractor

Topic	Mitigation Measure	Responsibility
MM-HYD-1 Stormwater Pollution Prevention Plan (cont.)	***Diversion Dikes*** • Diversion dikes shall have a maximum channel slope of 2 percent and shall be adequately compacted to prevent failure. The minimum height measured from the top of the dike to the bottom of the channel shall be 18 inches. The minimum base width shall be 6 feet and the minimum top width shall be 2 feet. The Contractor shall ensure that the diversion dikes are not damaged by construction operations or traffic. Diversion dikes shall be located as shown on the drawings or as needed based on Contractor operations. Location of diversion dikes shall be fully coordinated with cultural and natural environmental protection requirements described in Section 01355, Natural, Cultural, and Physical Resources Protection. ***Filter Fabric*** • The geotextile shall comply with the requirements of ASTM D 4439, and shall consist of polymeric filaments that are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of ester, propylene, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistance to deterioration due to ultraviolet and heat exposure. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0 to 120 degrees F. The filter fabric shall meet the following requirements: FILTER FABRIC FOR SILT SCREEN FENCE Physical Property / Test Procedure / Strength Requirement Grab Tensile / ASTM D 4632 / 100 lbs. min. Elongation (%) / / 30 % max. Trapezoid Tear / ASTM D 4533 / 55 lbs. min. Permittivity / ASTM D 4491 / 0.2 sec^{-1} AOS (U.S. Std Sieve) / ASTM D 4751 / 20-100 **Silt Fence Stakes and Posts** • The Contractor may use either wooden stakes or steel posts for fence construction. Wooden stakes utilized for silt fence construction, shall have a minimum cross section of 2 inches by 2 inches when hardwood is used and 4 inches by 4 inches when softwood is used, and shall have a minimum length of 5 feet. Steel posts (standard "U" or "T" section) utilized for silt fence construction, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 5 feet. **Identification Storage and Handling** • Filter fabric shall be identified, stored and handled in accordance with ASTM D 4873. ***Maintenance*** • The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures. • Silt fences shall be inspected in accordance with the below paragraph, Inspections. Any required repairs shall be made promptly. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. When a silt fence is no longer required, it shall be removed with approval of COR. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade. • Diversion dikes shall be inspected in accordance with the below paragraph, Inspections. Close attention shall be paid to the repair of damaged diversion dikes and necessary repairs shall be accomplished promptly. When diversion dikes are no longer required, they shall be shaped to an acceptable grade.	

Topic	Mitigation Measure	Responsibility
MM-HYD-1 Stormwater Pollution Prevention Plan (cont.)	***Inspections*** • The Contractor shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and area where vehicles exit the site at least once every 7 calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. Where sites have been finally stabilized, such inspection shall be conducted at least once every month. • Disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the Storm Water Pollution Prevention Plan shall be observed to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking. For each inspection conducted, the Contractor shall prepare a report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the Storm Water Pollution Prevention Plan, maintenance performed, and actions taken. The report shall be furnished to the COR within 24 hours of the inspection as a part of the Contractor's daily CQC Report. A copy of the inspection report shall be maintained on the job site.	
MM-HYD-2 Non-Hazardous Liquid Waste Management	Waste water from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, forms, etc. shall not be allowed to enter water ways or to be discharged prior to being treated to remove pollutants. The Contractor shall dispose of the construction related wastewater off Government property in accordance with all Federal, State, Regional and Local laws and regulations. Water contaminated with silt, grout, or other construction by-product must be pumped to a holding tank. Location of the holding tank will be proposed by Contractor and approved by Contracting Officer.	Contractor
MM-HYD-3 Hazardous Materials and Wastes	• Identify potentially hazardous substances to be used on the job site. • Identify handling procedures to ensure that hazardous substances are not released into the air, water, or ground. • Comply with Federal, State, and local laws and regulations for storage, handling, and disposal of these materials. • Storage of hazardous or flammable chemicals in the staging area or elsewhere on the site is prohibited except as approved by the Contracting Officer. • Hazardous materials shall not be discarded into the jobsite debris or waste-disposal facilities. • Empty containers shall be removed from the site and disposed of in a manner prescribed by law. • Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations. • A copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on site at any given time is to be maintained on site and submitted to the Contracting Officer. • Before new hazardous materials are brought on site or removed from the site, the MSDS file shall be updated and submitted to the Contracting Officer.	Contractor
MM-HYD-4 Spill Prevention and Response Plan (SPRP)	The California Regional Water Quality Control Board has issued a Cleanup and Abatement Order and Time Schedule Order to Yosemite National Park ordering that no sewage spills occur. The Contractor shall be required to follow the requirements of the Order and shall prepare a Spill Prevention and Response Plan (SPRP) and take appropriate spill prevention measures during all phases of the work. The California Regional Water Quality Control Board requires a minimum of 10 days to review the SPRP. All recommendations by the Board will be implemented at no additional cost to the NPS.	Contractor

Topic	Mitigation Measure	Responsibility
MM-HYD-4 Spill Prevention and Response Plan (SPRP) (cont.)	The primary purpose of the SPRP is to prevent sewage spills from occurring by proper planning and protection of the project area, and then to respond to any sewage spills that may occur during the course of this project including appropriate notification of staff. The Plan will be general in nature and typical to all phases of the work with site specific plans required for each area involving trenching or any work with the possibility of accessing the existing system. The sewer lines are located throughout Yosemite Valley and in close proximity to waterways and stream channels such that spilled sewage could possibly reach the Merced River. The SPRP is structured in two parts – first a Spill Prevention Plan and then a Spill Response Plan. The Spill Prevention Plan (SPP) includes evaluation of specific conditions, set-up of containment for actual construction work as well as for bypass pumping. Sewer bypasses must be constructed to tie existing lines into the new system and to tie the new system into the existing system. The Spill Response Plan (SRP) includes the initial response to stop and contain a spill, notification of staff, clean-up, and follow-up documentation. The SPP and the SRP together comprise the entire SPRP. A template of a plan follows at the end of this Section. An electronic version of this template will be provided to the successful bidder. All Contractor employees are required to be trained in the Spill Prevention Control in accordance with this SPRP.	
MM-HYD-5 Hazardous Materials Spill Prevention and Response Plan	Contractor shall provide a Hazardous Materials Spill Prevention and Response Plan to address spill prevention and response measures for hazardous substances used on site, including fuels. Prior to the start of work, the Contractor shall submit a plan that complies with YNP, Federal and State requirements and allows contractors to properly notify officials in the event of an emergency occurring during construction activities. YNP requirements include, and the plan shall state, at a minimum: • During non-work operations, stationary equipment shall be parked over specially prepared containment pads designed to trap any leaking oil, fuel, or hydraulic fluids. • Inspect construction site daily for proper storage of hazardous materials, proper parking of equipment on containment pads, and for hydraulic and oil leaks of equipment, tighten hoses, and ensure they are in good condition. • Routine oiling and lubrication shall be conducted in areas with secondary containment using Best Management Practices (BMPs) at all times. Refueling of equipment in wetlands or stream channel areas is not allowed at any time. • Contractor shall maintain secondary containment for all equipment operating with fluids (such as drilling) or when direct discharge of leakage, spills, or other source of construction or equipment fluids can flow directly to any streambed, whether flowing with water or dry. Containment shall be designed and installed so as to prevent accidental spills into streambeds in the event of mechanical failure or hose breakage. • Contractor shall maintain spill response materials on the project site when using heavy equipment to ensure rapid response to small spills. These materials shall include absorbent pads, booms, or other materials as appropriate to contain oil, hydraulic fluid, solvents, and hazardous material spills. A list of the spill response materials to be kept on site shall be submitted to the Contracting Officer. • Contractor shall provide names and phone numbers of appropriate contractor's personnel to be contacted at any time (24 hours per day) regarding accidental release of hazardous substances to air, soil or water. This list shall be submitted to the Contracting Officer and a copy visibly displayed in work areas on site. Contractor shall have the Contracting Officer's and other appropriate Government emergency numbers posted and shall immediately notify the Contracting Officer or other Government representative on any accidental release of hazardous substances to air, soil, or water. • Hazardous or flammable chemicals shall be prohibited from storage in the staging area, except for those substances identified in the Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan. Hazardous waste materials shall be immediately removed from project site in approved containers. Comply with all applicable regulations and policies during the removal and remediation of asbestos, lead paint, and polychlorinated biphenyls.	Contractor
MM-HYD-6 Establish Boundary of Riparian Buffer Zone	Prior to developing construction design documents for projects within the river corridor, the contractor shall survey the ordinary high water mark; the determination of the high water mark will be in accordance with U.S. Army Corps of Engineers guidance. Survey(s) of the ordinary high water mark will be used to determine the boundary of the riparian buffer. All new development shall be located outside of the riparian buffer, which encompasses the area within 150 feet of the ordinary high water mark on both sides of the river.	Contractor

Topic	Mitigation Measure	Responsibility
VEGETATION AND WETLANDS		
MM-VEG-1 Protection from Exotic Plant Species	The park and contractor shall undertake measures to prevent the introduction of exotic species in the project area and staging areas. All earth moving equipment must enter the Park free of dirt, dust, mud, seeds, or other potential contaminant. Equipment exhibiting any dirt or other material attached to frame, tires, wheels, or other parts shall be thoroughly cleaned by the Contractor before entering the Park. All equipment will be directed to the El Portal Maintenance Facility for inspection prior to commencing work. Areas inspected shall include, but not be limited to, tracks, track guard/housings, belly pans/under covers, buckets, rippers, and other attachments. Equipment that does not pass inspection will be turned around to the nearest cleaning facility outside the park. If vehicles are unable to drive to El Portal due to size or load restrictions, vehicles will be inspected at a mutually agreed site by the Contracting Officer prior to entering the Park. The Contractor shall notify the Construction manager at least two work days (not including weekends) prior to bringing any equipment into the Park. Equipment found to have entered the Park with potential contaminants will be removed from the Park at the direction of the Contracting Officer at Contractor's sole expense. Contractor shall minimize ground disturbance to the greatest extent possible. The contractor shall get approval in writing from the Contracting Officer for fill material that must be used in a way or stored in a location not clearly specified in the contract. Fill materials used within the top 12 inches of finished grade are required to be free of exotic and noxious weed species and shall have the source locations approved by the Contracting Officer. The Contractor shall submit to the Contracting Officer a list of proposed sources for imported fill materials requiring certification 30 calendar days in advance of importing material. The presence of noxious weed species is grounds for rejection of the source. If exotic weed species are found or suspected, the Contractor may be required to strip the top 12 inches of source material and only import sub-surface material and/or sterilize the material, at the Contracting Officer's discretion. The presence of the following particularly noxious weed species are grounds for rejection of the source: spotted knapweed, yellow star-thistle, perennial pepperweed, broom species, and other species on the California State List of Noxious Weeds. If spraying is required, the Contractor shall provide a licensed operator to spray according to applicable state regulations and park management guidelines (e.g., the Invasive Species Management Plan). The Contractor shall not spray any herbicides until approved in writing by the Contracting Officer. Drain and flush all pumps, tanks, live wells, buckets and other containers that might carry water contaminated with exotic plants and animals, such as the zebra mussel, prior to bringing equipment into the park. Thoroughly wash all hauling tanks and equipment using a hard spray from a garden hose. If equipment was used in infested waters, use the following steps to clean the equipment: • Wash with hot water (140 F or 40 C) or a high pressure washer (250 pounds per square inch). Remove all aquatic weeds -- they can carry zebra mussels. • Disinfect equipment. Recent research shows that disinfection of nets and equipment with benzalkonium chloride at typical treatment rates (10 milligrams per liter for 24 hours, 100 milligrams per liter for 3 hours, or 250 milligrams per liter for 15 minutes) will effectively eliminate most exotic animals. Two other commonly used disinfectants, calcium hypochlorite and iodine, are ineffective against zebra mussels. Adult zebra mussels can live more than a week out of water in moist, shaded areas. Dry pumps, nets and other equipment used in infested waters in the sun for two to four days after cleaning. If adult mussels are present, dry equipment for two weeks.	Yosemite National Park; Contractor
MM-VEG-2 Vegetation Inventory and Assessment	Plant Condition Inventory: The Contractor and the Contracting Officer or designated representative, shall perform an on-site inventory of trees and other overall vegetation features within or near to the work limits. A print of the contract drawings showing tree locations and a photo record will be used to note condition of trees and vegetation. This annotated drawing will be retained by the Contracting Officer for use during the final walk-through and tree/vegetation assessment. This walk through shall be a part of the project closeout requirements (see Section 01770, Project Closeout). On-site inventory shall be scheduled in coordination with the pre-construction conference.	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
MM-VEG-2 Vegetation Inventory and Assessment (cont.)	Avoid construction, trenching, grading, paving, and staging within the drip line of valley oaks (*Quercus lobata)* and black oaks (*Quercus Keloggii*). If removal, damage or such activity cannot be avoided, contractor shall consult with the Park Botanist to develop a mitigation strategy prior to construction in addition to the measures outlined below. Access to work sites requiring travel through undeveloped areas outside the work limits must be approved by the contracting officer. Provide temporary barriers (e.g., orange construction fence) to protect existing trees, plants and critical root zones that are designated to remain, but are: (1) within the construction limits; 2) on or just outside the construction limits; (3) within the clearing limits (i.e., the zone extending 5 feet beyond the staked construction limits); or (4) on, or just outside the clearing limit line. Barriers shall be in place before construction begins. Trees, shrubs, vines, grasses, and other vegetative features indicated and defined on the construction drawings to be preserved shall be clearly identified by marking, fencing, or any other approved techniques. The Contractor shall restore vegetative features damaged or destroyed during construction operations outside the limits of the approved work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy resources including trees, shrubs, vines, grasses, topsoil, and landforms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. Removal of trees will be performed by YNP in advance of Contractor's work. Should it be determined during the course of work that additional trees or tree roots require removal, Contractor shall notify the Contracting Officer who will coordinate an inspection and determination by the appropriate authorities whether to remove the tree or not. After tree removal, large roots may remain in the ground. Contractor shall be responsible for carefully removing in-ground tree roots of removed trees to permit excavation, drilling, or other ground penetrating construction activities. During tree root removal, do not use backhoes, chains, or other equipment in a manner that will harm roots of adjacent trees. Minimize disturbance to tree trunks and root zones to prevent damage to trees. Adjust trenches and other excavations to keep them beyond the drip line wherever possible. Attempt to maintain the following minimum clearances between the edges of tree trunks and excavation**:** • for trees more than 30-inch-in-diameter - 10 feet • for trees between 15-inch and 30-inch-in-diameter - 8 feet • for trees less than 15-inch-in-diameter - 5 feet Adjust the survey line, as necessary to maintain required clearances. Notify the Contracting Officer of any proposed trenches or other excavations within the drip line of trees. Steps to Mitigate Damage to Roots Due to Excavation: Take steps (as called for below) to mitigate damage to tree roots due to excavation, wherever the following circumstances apply: • Wherever excavation must take place within the drip line of oak trees regardless of diameter. • Wherever excavation must take place within the drip line of trees other than oaks, for all trees 12 inches or larger in diameter. Adjustments in trench alignment or other factors may result in variations in which trees are affected. The Contractor shall accommodate these variations at no additional expense to the Government. Following are the steps which are required to mitigate damage to roots due to excavation: • Excavate carefully where tree roots might be encountered. Where roots 2 inches and larger are encountered, hand excavate as required to prevent damage to roots. Tunnel under roots to be saved, hand excavating as necessary. • Do not cut roots over 2-inch-in-diameter without approval of Contracting Officer. • Cleanly saw-cut roots between 1-inch and 2-inch-in-diameter where they interfere with work; do not cut roots except as necessary. Roots between 1-inch and 2-inch-in-diameter which must be cut shall be cleanly saw-cut near the edge of trench closest to the tree to prevent roots from being dislodged from soil by equipment. • Avoid soil compaction within plant root zones with heavy equipment and vehicles within the project work limits. • Do not cut wheels or make sharp turns with wheeled or tracked equipment in root zones.	

Topic	Mitigation Measure	Responsibility
MM-VEG-2 Vegetation Inventory and Assessment (cont.)	• Do not pile excavated soil against tree trunks. • Do not mechanically compact soils in undeveloped areas except to meet minimum compaction requirements as approved by the contracting officer. • Maintain original soil topography in plant root zones whenever possible. • Preserve tree snags where feasible as potential bat or bird habitat.	
MM-VEG-3 Plant Appraisal	If the Contractor destroys or injures trees and vegetation designated for protection or outside the work limits, the Contractor will be assessed damages prior to final progress payment. Replacement costs for damaged vegetation will be computed according to the method described in the International Society of Arborculture's 1992 Guide for Plant Appraisal. This method is based on the cost of the largest commonly available tree or shrub, with modifications based on species value, condition, and location. A trained arborist or professional plant appraiser from the California region will be hired by the NPS to make the damage appraisal. The arborist's fees will be included in the damage assessment. This damage appraisal process will be triggered by any of the following types of damage to vegetation outside the work limits or unauthorized disturbance of vegetation within the work limits. • Removal of any tree or shrub. • Pruning or removal of more than 30 percent of a tree or shrub canopy. • Removal or fracture of any limb or trunk that is one of the major structural entities of the damaged plant. • Removal or fracture of any limb greater than 12 inches in diameter. • Bark damage or removal around more than 30 percent of the trunk circumference. • Trenching or soil disturbance within the critical root zone that is deeper than 1-foot unless shown on the Drawings. If the damaged vegetation is protected under the Endangered Species Act or other special legislation, additional penalties may be assessed as per consultation with the U.S. Fish & Wildlife Service. Pruning or removal of vegetation shall be supervised by Contracting Officer. The designated personnel may designate plant species for salvage. When authorized and supervised by the Contracting Officer, the Contractor is exempted from any penalties that might be assessed due to damage to vegetation. • Acceptable disturbance to roots is limited to 15 percent of the area under the drip line being either cut or filled. Any tree with more than 50 percent of its roots disturbed should be removed during construction at the direction of the Contracting Officer. • Wounds occurring from construction activity may be possible entry sites for disease spores. If a tree is accidentally injured during construction, it may need to be removed at the direction of the Contracting Officer. Trench alignments or other factors may result in variations in which trees are affected. The Contractor shall accommodate these variations at no additional expense to the Government. Minor cuts and damaged areas shall be assessed by the Contracting Officer. Repair to the plant will be at the recommendation of the YNP personnel and approval of the Contracting Officer.	Yosemite National Park; Contractor
MM-VEG-4 Wetlands Delineation	Delineate wetlands and apply protection measures during construction. Wetlands shall be delineated by qualified National Park Service staff or certified wetland specialists and clearly marked prior to work. Perform activities in a cautious manner to prevent damage caused by equipment, erosion, siltation, etc. Use non-toxic materials for decking and sealants where possible.	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
MM-VEG-5 Wetlands Regulation	The Contractor shall adhere at all times to the conditions of U.S. Army Corps of Engineers Nationwide Permit No. 33, Temporary Construction, Access and Dewatering, with the following conditions as a minimum: • All work will be subject to the Standard and Technical Conditions of the Certification of the California Regional Water Quality Control Board, a copy which will be provided to the Contractor. • Work in streambeds is to be performed in periods of low water conditions. Contractor shall monitor stream flow conditions and weather forecasts at all times during the course of the work. During thunderstorms or other intense rain conditions, streambeds at Yosemite can fill rapidly. • Re-grade and restore disturbed areas to preexisting contours to maintain drainage patterns.	Contractor
MM-VEG-6 Wetlands Protection	The Contractor shall fence construction areas adjacent to aquatic habitats to prohibit the movement of aquatic species into the construction area and to control siltation and disturbance in aquatic habitats. The Contractor shall salvage and reuse wetland soils as fill to the maximum extent possible. The Contractor shall use trench plugs where designated on the drawings in wetland areas to prevent changes to natural flow patterns. During dewatering, intakes shall be completely screened with wire mesh not larger than 5 millimeters to prevent aquatic species from entering the pump system. Water shall be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Access routes to and through work locations in the meadows and wetlands shall be planked with 1 1/8" plywood, stabilization mats or other method approved by the contracting officer.	Yosemite National Park, Project Manager; Contractor
MM-VEG-7 Subsequent Wetland Statements of Finding	As site-specific information becomes available at a level of detail needed to fully and accurately disclose anticipated impacts on wetland habitats, processes, functions, and values, subsequent WSOFs for all other actions will be developed.	National Park Service
MM-VEG-8 Special Status Plant Species	If special-status plant species are identified within the construction disturbance zone, in particular within restoration and revegetation areas, avoid special-status plant populations to the extent feasible during construction activities. If it is not feasible for construction activities to avoid special status plant species, species conservation measures will be developed in coordination with Yosemite National Park natural resources staff. Measures may include salvage of special-status plants for use in revegetating disturbed areas and transplantation of special-status plants wherever possible using methods and monitoring identified in the revegetation plan, monitoring to ensure successful revegetation, protection of plantings, and replacement of unsuccessful plant materials if practicable.	Yosemite National Park; Contractor
WILDLIFE AND SPECIAL STATUS SPECIES		
MM-WL-1 Fish and Wildlife Protection	The Contractor and Contractor's employees shall not feed any animals within Yosemite National Park. The Contractor shall make all reasonable efforts in accordance with the plans and specifications for the protection of threatened or endangered or candidate species including their habitat in accordance with Federal, State, Regional, and local laws and regulations. Contractor shall schedule construction activities with seasonal consideration of wildlife lifecycles to minimize impacts during sensitive periods (i.e., after bird nesting seasons, when bats are neither hibernating nor have young, etc.); limit the effects of light and noise on adjacent habitat through controls on construction equipment; and provide adequate education and enforcement to limit construction worker activities that are destructive to wildlife and habitats. Contractor shall maintain animal escape routes from excavated pits and trenches. During construction, Contractor personnel shall maintain vigilance for animals caught in excavations and take appropriate action to free them. • Excavation pits shall have a ramp or incline at either end to allow for human and wildlife escape. • Each morning prior to commencing work activities, Contractor shall inspect the site for trapped wildlife in excavation pits and carefully remove, except for California red-legged frog (CRLF), which shall not be captured or handled.	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
MM-WL-2 Bear Precautions	Bears may be present at any location within the YNP boundaries, including at the project site. The Contractor shall incorporate the following precautions in all activities within the YNP boundary. All food, toiletries, and scented items (i.e., bug spray) shall be placed in bear boxes at the construction site provided by the Contractor. Bear boxes must remain closed and latched at all times, unless items are being retrieved. No food, toiletries, or scented items shall be stored in vehicles or left out. • All food waste and food-related waste shall be disposed of in accordance with Non-Hazardous Solid Wastes requirements described elsewhere within this section. • All vehicles shall be checked daily to ensure that no items that may attract bears remain inside an unattended vehicle. Items that shall not be left in vehicles include canned food, drinks, soap, cosmetics, toiletries, domestic trash, recyclable food containers, ice chests, grocery bags, and unwashed items used for preparing or eating meals. • All windows and doors in recreational vehicles or trailers used for lodging or office space shall be closed and latched when not occupied. • The Contractor shall walk the job site at the end of each day and check for trash, food, and food-related items remaining at the site and dispose of the items in a bear-proof receptacle. • Proper food storage is important to the welfare of the Yosemite bear population and is required by law. The Contractor shall receive and all Contractor personnel shall read a brochure entitled, The Bears are not to Blame, provided by NPS staff as a courtesy. Contractor staff shall call the Save-a-Bear hotline (209) 372-0322 to report overflowing trash containers, improperly stored food, or bear sightings.	Contractor
MM-WL-3 Construction Timing	Schedule construction activities with seasonal consideration of wildlife lifecycles to minimize impacts during sensitive periods (i.e., after bird nesting seasons, when bats are neither hibernating nor have young, etc.).	Yosemite National Park; Contractor
MM-WL-4 Bat Habitat Protection Guidelines	A qualified bat biologist will conduct surveys prior to construction to evaluate whether habitat that will be affected by the proposed action provide hibernacula or nursery colony roosting habitat for bat species. If bats are detected during reproduction or hibernation periods, disturbance of potential habitat will be delayed until the bats can be excluded from the area in a manner that does not adversely affect their survival or that of their young. If bats are detected during reproduction or hibernation periods, disturbance of potential habitat will be delayed until the bats can be excluded from the area in a manner that does not adversely affect their survival or that of their young. If surveys conducted immediately prior to construction do not reveal any bat species present within the project area, then the action will begin within three days to prevent the destruction of any bats that could move into the area after the survey.	Yosemite National Park; Contractor
MM-WL-5 Bird Habitat Protection Guidelines	Beginning in early spring, a park wildlife biologist will conduct bird surveys and review current owl reports to determine whether special status species are present and may be mating, nesting, or foraging in the project vicinity. If nesting birds are observed (e.g., discovered by workers) that are not special status species, the project manager will notify the park wildlife biologist who will recommend steps to avoid undesirable impacts to the nest or young.	Yosemite National Park, Project Manager
MM-WL-6 Fish and Wildlife Protection	The NPS will brief the contractor regarding wildlife concerns at project initiation and periodically throughout the project to avoid activities that are destructive to wildlife and habitats.	Yosemite National Park
MM-WL-7 Fish and Wildlife Protection	If deemed appropriate by the NPS aquatic or terrestrial ecologist, a NPS biologist will conduct a once-a-month survey throughout the active season for special status species, including CRLF. If the biologist finds evidence of the species, ground disturbance and construction activities will be flagged for avoidance and a biological monitor may be needed to oversee construction. If a special status species is encountered within work areas, work crews will stop all activities in the surrounding area with the potential to harrass, injure, or cause death of the individual. For special status species other than CRLF, NPS biologist will assess the situation and select a course of action that will avoid adverse effects to the individual. If a CRLF is encountered, the NPS will contact the Fish and Wildlife Service for further guidance prior to commencing activities in the surrounding area.	Yosemite National Park

Topic	Mitigation Measure	Responsibility
MM-WL-8 Fish and Wildlife Protection	A NPS biologist shall inspect the area and evaluate the necessity of fencing, signage, or other measures to protect the animal. If appropriate, the special status species shall be allowed to move out of the hazardous situation on their own volition to a safe location. The animal may not be picked up and moved based on it not moving fast enough or it is an inconvenience for activities associated with rehabilitation or operation. Special status species (other than CRLF) shall be captured and moved by hand only when there is no other option to prevent harassment, injury, or death. If appropriate habitat is located immediately adjacent to the capture location, this is the preferred option for relocation. The special status species should not be moved outside of the radius it would have traveled on its own. Under no circumstances shall special status species be relocated off NPS property.	Yosemite National Park
MM-WL-9 Construction timing	Contractor would encourage employees to drive slowly on rainy, warm nights (nights where California red-legged frog dispersal is likely).	Contractor
MM-WL-10 Fish and Wildlife Protection	If a CRLF is encountered in the project area, all activity in the surrounding area shall stop and the CRLF shall be allowed to move out of the project area on its own volition. Prior to commencing project activities, the NPS will contact the Fish and Wildlife Service to reinitiate consultation. Under no circumstance shall Contractor personnel nor NPS staff capture, handle, or relocate CRLF.	Yosemite National Park
LIGHTSCAPES		
MM-LITE-1 Yosemite Lighting Guidelines	All new sources of lighting, or substantial modifications to structures with existing sources of exterior lighting, shall conform to the standards set forth in the Yosemite Lighting Guidelines, available on the park's website at: http://www.nps.gov/yose/naturescience/dark-night-sky.htm.	Yosemite National Park; Contractor
MM-LITE-2 Night Lighting During Construction	Minimize night lighting during work. If night lighting is necessary, design lighting to be minimal, directed downward, and shielded.	Yosemite National Park; Contractor
MM-LITE-3 Yosemite National Park Lighting Guidelines	*Yosemite National Park Lighting Guidelines* shall be followed to ensure that all exterior lighting in the park is designed to mitigate light pollution and to preserve the natural darkness as much as possible.	National Park Service
SOUNDSCAPES		
MM-NOI-1 Construction Work Plan and Schedule	Contractor shall submit to the park for review and approval prior to commencement of construction a construction work plan/schedule that specifies the ways in which the contractor will minimize construction-related noise in noise-sensitive areas. At a minimum, the plan shall state the following: • Ensure that all construction equipment has functional exhaust muffler systems. • Use hydraulically or electrically powered construction equipment, when feasible. • Locate stationary noise sources as far from sensitive receptors as possible. • Limit the idling of motors except as necessary (e.g., concrete mixing trucks). • A construction schedule that minimizes impacts to adjacent noise-sensitive activities. • Engine braking ("jake" brakes) shall not be used in lodging, camping, or residential areas. Engine brakes that are used shall be muffled. • Continuous noise abatement is required to prevent disturbance and nuisance to Park visitors and workers and to the occupants of adjacent premises and surrounding areas. • If the Contracting Officer determines excessive noise is emanating from the construction site, the Contractor may be required to provide sound barriers to deflect noise transmission from visitor areas or other areas impacted by noise.	Contractor

Topic	Mitigation Measure	Responsibility
MM-NOI-1 Construction Work Plan and Schedule (cont)	• Construction noise shall be minimized through use of best available noise control techniques wherever feasible. Sound levels must be kept to a minimum at all times. Equipment and machinery shall not exceed 85 dB when measured at 100 linear feet distance. Contractor shall use sound attenuated compressors and generators that comply with the most recent California Department of Transportation standards.	
MM-NOI-2 Noise Management Levels	Contractor shall ensure that all construction equipment and practices adhere to the following noise limitations: Repetitive and/or intermittent, high-level noise: Permitted only during Daytime. Do not exceed the following dB(A) limitations at 50 feet: Sound Level in dB(A) — Time Duration of Impact Noise 70 — More than 12 minutes in any hour 80 — More than 3 minutes in any hour Maximum permissible construction equipment noise levels at 50 feet: Earthmoving — dB(A): Front Loaders 75; Backhoes 75; Dozers 75; Tractors 75; Scrapers 80; Graders 75; Trucks 75; Pavers, Stationary 80; Pumps 75; Generators 75; Compressors 75 Materials Handling — dB(A): Concrete Mixers 75; Concrete Pumps 75; Cranes 75; Derricks Impact 75; Pile Drivers 95; Jack Hammers 75; Rock Drills 80; Pneumatic Tools 80; Saws 75; Vibrators 75 *Ambient Noise:* Maximum noise levels (dB) for receiving noise area at property line shall be as follows: Residential receiving area — Daytime: 65 dB; Nighttime: 45 dB Commercial/Industrial receiving area — Daytime: 67 dB; Nighttime: 65 dB In the event the existing local ambient noise level exceeds the maximum allowable receiving noise level (dB), the receiving noise level maximum for construction operations shall be adjusted as follows: Residential receiving area: Maximum 3 additional dB above the local ambient as measured at property line. Commercial/Industrial receiving area: Maximum 5 additional dB above the local ambient as measured at the property line.	Contractor

Topic	Mitigation Measure	Responsibility
MM-NOI-3 Field Quality Control	Contractor shall assess potential effects of construction noise on adjacent neighbors or facility occupants in accordance with ASTM E1686 and as follows: Ambient noise measurement: Measure at the property line at a height of at least four (4) feet above the immediate surrounding surface. Average the ambient noise level over a period of at least 15 minutes. Ambient noise measurement at urban sites: Conduct during morning peak traffic hour between 7 A.M. and 9 A.M. and afternoon peak traffic hour between 4 P.M. and 6 P.M. In addition, conduct a 24-hour measurement at the proposed project site to document the noise pattern throughout the day. Adjust and weight for seasonal and climatic variations. Monitor noise produced from construction operations in accordance with ASTM E1780.	Contractor
AIR QUALITY		
MM-AIR-1 Dust Abatement Program	The Yosemite National Park and/or a contractor (as appropriate) shall prepare, implement, and comply with a dust abatement program during construction. Measures include, but are not limited to, the following: • Water or apply soil stabilizers to disturbed areas; • When hauling dry materials, securely cover truck beds to prevent blowing dust or loss of debris; • Limit speeds to a maximum of 15 mph within construction areas. Slower speeds shall be maintained if necessary to reduce dust formation. • Minimize vegetation clearing; • Re-vegetate disturbed areas post construction; • At construction zone access points, prevent paved areas from accumulating mud, soils, and other organic materials.	Yosemite National Park; Contractor
MM-AIR-2 Equipment Exhaust Controls	The Yosemite National Park and/or a contractor (as appropriate) shall prepare, implement, and comply with equipment exhaust controls program during construction. Measures include, but are not limited to, the following: • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to two minutes. Clear signage shall be provided for construction workers at all access points; • Require that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NOx and PM; • Require all contractors use equipment that meets CARB's most recent certification standard for off-road heavy duty diesel engines; • Require all equipment operations to occur during daytime hours to minimize effects of local inversions; • Equipment operations shall be in accordance with all Federal and State air emission and performance laws and standards. • Vehicles or equipment with excessive emissions or discharging black smoke will be removed from operation immediately and may not be used until appropriate maintenance and repairs have corrected the emissions problem.	Yosemite National Park; Contractor
VISITOR EXPERIENCE		
MM-VEX-1 Non-Hazardous Solid Waste Management Measures	Waste, trash, and debris shall be controlled at all times and disposed in authorized containers in the Contractor's staging area. All sanitary waste (garbage) must be disposed of in approved, bear-proof disposal bins. Provide lockable, bear-proof dumpsters with lids for waste (garbage) storage. Lids shall be equipped with carabineers/heavy wire lid locks. Verify that dumpster lids are secure at close of work each day. Construction debris (rubbish) may be stored in unlidded dumpsters or construction debris truck/trailers and removed on a regular basis. Do not mingle sanitary or green waste with construction debris. All large, normally open top, waste bins or dumpsters shall be lidded and clearly marked "No Food or Trash". All construction personnel shall adhere to park regulations concerning food storage and refuse management.	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
MM-VEX-1 Non-Hazardous Solid Waste Management Measures (cont)	The Contractor shall designate an employee to police the work site daily for waste, wrappers, food packaging and the like. All waste shall be picked up and disposed of in lidded bear-proof dumpsters. Green waste shall be segregated from other non-green waste for processing at disposal site. Burying or burning of trash and debris on-site is not permitted. All un-used materials, trash, and debris shall be the property of the Contractor and shall be transported outside of the YNP boundary for disposal in accordance with law. Remove debris from permanently closed spaces prior to enclosing them. Properly secure trash during the workday and remove all trash from site at the end of each workday	
MM-VEX-2 Scenic Resource Protection	Fence construction staging areas and construction activity areas to visually screen construction activity and materials. Consolidate construction equipment and materials to the staging areas at the end of each work day to limit the visual intrusion of construction equipment during nonwork hours.	Yosemite National Park; Contractor
TRANSPORTATION		
MM-TRA-1 Traffic Control Plan	Contractor shall prepare a Traffic Control Plan. This plan shall include but not be limited to the following: • Maps showing how any detour routes will be signed and controlled. • Submission of specific street closure and detour plans for each segment of the project no less than 3 weeks prior to beginning construction on any segment. • Description of how Contractor shall provide for the protection of pedestrians and bicyclists, and safe vehicle passage through the use of signs and flag persons. In addition, address how access for emergency vehicles, chain-up areas and snow plow turn around areas, police, rangers, fire and disaster units shall be maintained at all times. • Show how any detour routes will be signed and controlled. Furnish and install all signs. Provide flag persons as required. • Revise and update the Traffic Control Plan to reflect changes in the project schedule or sequence of work, as required. • Show measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud and dust transported onto paved public roads by vehicles or runoff. • Revise and update specific Traffic Control Plan to reflect changes in the project schedule as required, or to accommodate the traffic control plans of other projects concurrently under construction in the project vicinity or the Yosemite Valley. • The YNP Project Manager will provide temporary traffic routing and control information from other on-going or planned projects that may affect the Contractor's Traffic Control Plan. The Contractor shall accommodate the information from these other traffic control plans as necessary and bring any conflicts to the attention of the COR immediately.	Contractor
MM-TRA-2 Road Closure Traffic Control and Detour Plans contents	Prepare and submit specific Road Closure Traffic Control and Detour Plans for each area of the project not less than 3 weeks before beginning construction on any segment. Provide for the following: • Temporary closure of both lanes of traffic (subject to the requirements listed herein) shall be limited to periods of 20 minutes maximum. Requests for additional closure periods shall be submitted in writing to the Contracting Officer a minimum of 7 days prior to any planned road closures. • Single lane traffic diversions shall comply with the detail in "Traffic Control System for Two Lane Conventional State Highways" in California Department of Transportation Standard Specifications, Section 02201, Paragraph 1.1 D.	Contractor

Topic	Mitigation Measure	Responsibility
MM-TRA-3 Traffic Control Devices	Traffic control devices shall be provided in sufficient quantities and types as required to provide safe and adequate traffic control. During hours of darkness, approved lights and/or flares shall be included, in proper working order, to illuminate signs and hazards and alert approaching traffic. Barricades shall be furnished and maintained along all open trenches in contact with traffic. No work may begin on any day or at any time before traffic control devices have been placed, test driven and, if required, adjusted and revised. All traffic control devices shall be placed in accordance with the Manual of Traffic Controls and favorably reviewed Traffic Control Plan. Locations of devices shall be adjusted to suit the conditions and circumstances of each detour situation. In all cases, signs shall be placed to most effectively convey their messages to approaching traffic. Immediately after traffic control devices have been placed, the detour shall be test driven by the COR and Contractor's representative. Test drive shall include approach to the detour from each possible direction and traversing full length of each detour route. The Contractor shall adjust and revise all traffic control devices as determined to be required by test drive through and shall repeat test drive if determined necessary by the COR. The Contractor shall provide additional traffic control devices if required to maintain flow of traffic through construction operation. The Contractor shall maintain all traffic control devices, at proper locations and in proper working order, at all times during construction operations and whenever a hazard resulting from Contractor's operations exists. The Contractor shall adjust and revise traffic control devices, placement, etc., to suit changing conditions around construction operations. Traffic control devices shall remain in place at all times required to alert approaching traffic of upcoming hazards. After hazard has been removed, all traffic control devices shall be removed. Signs shall be removed or their messages covered.	Contractor
MM-TRA-4 Traffic Control Flaggers	The Contractor shall employ flaggers: • As required for each specific detour. • At all locations on a construction site where barricades and warning signs cannot control the moving traffic. Where flaggers are required, they shall be logically placed in relation to the equipment or operation so as to give adequate warning and shall be placed approximately 100 feet ahead of impact point. A warning sign shall be placed ahead of the flagger reading: "Flagger Ahead." The distance between the sign and the flagger should be based on the average traffic speed, allowing approximately 50 feet for each 10 miles per hour. During hours of darkness, flagger stations shall be illuminated such that the flagger will be clearly visible to approaching traffic. Lights for illuminating the flagger station shall receive favorable review by the COR. The flagger shall be provided with and wear a red or orange warning garment when flagging. Flaggers shall be provided with approved hand signs and two way radios for communication. When flagging during hours of darkness, the flagger shall signal with a red light or flare and shall have a belt and suspender harness outside his garment fitted with reflectors or made from reflectorized cloth, unless the garment is well reflectorized in one of these ways.	Contractor
MM-TRA-5 Traffic Control and Maintenance	Traffic control and construction operations shall conform to the requirements of California Department of Transportation Standard Specifications, Section 12, except as modified herein. The Contractor shall provide, install, and maintain all necessary signs, lights, flares, barricades, markers, cones, flagmen, and other protective facilities and shall take all necessary precautions for the protection and for the convenience and safety of Park employees, public traffic, and Yosemite Concession Service operations. All such protective facilities and precautions to be taken shall conform to the U. S. Department of Transportation, Federal Highway Administration Manual on Uniform Traffic Control Devices for Streets and Highways, Part VI-Traffic Control for Highway Construction and Maintenance Operations, latest edition, and as amended. Provide for the protection of pedestrians, bicyclists, and equestrians at all times. Provide adequate, safe, non-skid bridging material over trenches, including shoring when trenching in pavement areas to handle all types of vehicular traffic.	Contractor

Topic	Mitigation Measure	Responsibility
MM-TRA-5 Traffic Control and Maintenance (cont)	Whenever the Contractor's operations create a hazardous condition, the Contractor shall furnish flag persons and guards as necessary to give adequate warning of any dangerous conditions to be encountered, and shall furnish, erect, and maintain such fences, barricades, lights, signs, and other devices as necessary to prevent accidents and avoid damage or injury to persons. Employ flag persons to direct traffic as required to ensure safe vehicular travel. While on duty, flag persons and guards shall be equipped with orange safety wearing apparel and a paddle-type signal, which shall be clean and in good repair. Provide two-way programmable radios to flag persons if they are not in sight of each other at all times, or if necessary to ensure safe passage of vehicles. Provide, install, and maintain all signs, barricades, posts, guards and notices whenever a road or trail must be completely closed. Note that if posts are installed in ground, Contractor must contact USA-Dig and Archaeological Monitor for clearance to avoid culturally-sensitive areas. Remove or cover signs in conflict with traffic control requirements. Provide for passage and access of emergency vehicles, police, rangers, fire and disaster units at all times. Contractor assumes any and all liability for any damages resulting from failure to provide said access. Replace permanent pavement markings and traffic signs upon completion of each phase of work. At the end of each day's work or as soon as the work is completed remove all traffic control devices no longer needed to permit free and safe passage of traffic. Removal shall be in reverse order of installation. The traveled way shall not be obstructed with material, bedding, trench soil, nor with barricades or excavations. Excavations shall be backfilled, covered with steel traffic plate covers, or otherwise suitably protected so that traffic can pass unobstructed, as required, at night or over weekends and holidays. Temporary road repairs shall include road base and cold mix as specified to maintain a smooth, hard surface. The Contractor shall provide weekend and holiday road maintenance and repairs as necessary. All roads shall be kept open for public travel at all times unless specific written permission to close or restrict the use of a particular road is given by the COR. The Contractor is responsible for snow and ice control within the project limits utilizing NPS approved methods. Permission shall be granted upon approval of the specific Street Closure Traffic Control and Detour Plan for the intended closure. In the event that closing of a particular road is approved, it shall be the responsibility of the Contractor to notify the COR to reconfirm the hours and dates of the street closure and routes of detours at least 7 calendar days in advance of their occurrence, and again to notify the COR when the travel restriction is discontinued. No materials or equipment shall be stored where it will interfere with the free and safe passage of public traffic, and at the end of each day's work and at other times when construction operations are suspended for any reason, the Contractor shall remove all equipment and other obstructions from that portion of the roadway to be opened for use by public traffic. No material or other obstructions shall be placed within 20 feet of fire hydrants, which shall at all times be readily accessible to the fire department, nor within 10 feet of United States mailboxes. Off-loading of materials at staging area shall be coordinated with the Contracting Officer as necessary. Traffic delays due to Contractor's activities and associated traffic control shall not exceed 20 minutes, unless prior written approval has been received from the Contracting Officer. Alternative access for Park visitors to all major features and facilities in the Park shall be maintained using the existing road system. Full access shall be provided year-round to the public for all operating Park facilities (hotels, campgrounds, bike paths, trails, stores, restaurants, museums, restrooms, etc.), unless the project includes closing, rehabilitating or reconstructing those facilities, except trail closures for equipment and material transfer or transport described in Section 01110, Summary of Work.	
CULTURAL RESOURCES		
MM-CR-1 Evaluation of Revetment Removal Sites	Prior to any ground disturbing activities associated with revetment, further analysis and possible documentation at each site would be required in order to assess potential adverse effects to historic resources.	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
MM-CR-2 Evaluation of Revetment Removal Sites	As per Section 106 of the NHPA, prior to construction or demolition activities, the Park shall survey the project area for potential impacts to historic buildings, structures, and districts within the project area of potential effect (APE). This will include a review of existing known historic resources for their continued integrity and eligibility for listing in the National Register, identification of currently unknown historic properties within the APE, determination of potential adverse effects and resolution of those effects in compliance with 36 CFR Part 800 – Protection of Historic Properties. Every effort shall be made to avoid adverse impacts. These efforts may include screening and/or sensitive design that would be compatible with cultural landscape resources.	Yosemite National Park; Contractor
MM-CR-3 Submittals	Historic Preservation Treatment Program: The contractor shall submit a written plan for each phase or process including protection of surrounding materials during operations. Contractor shall describe in detail materials, methods, and equipment to be used for each phase of work. If alternative methods and materials to those indicated are proposed for any phase of work, contractor shall provide a written description including evidence of successful use on other, comparable projects, and program of testing to demonstrate effectiveness for use on this Project. The contractor shall document, through videotape or photograph and submit to the Contracting Officer prior to commencement of work, existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by historic treatment operations.	Yosemite National Park; Contractor
MM-CR-4 Removed and Salvaged Historic Materials:	Contractor shall handle removed and salvaged historic materials in accordance with the following: • Clean salvaged historic items. • Pack or crate items after cleaning. Identify contents of containers. • Store items in a secure area until delivery to the NPS. • Transport items to storage area approved by Contracting Officer. • Protect items from damage during transport and storage. • Do not dispose of items removed from existing construction without prior written consent of Contracting Officer.	Yosemite National Park; Contractor
MM-CR-5 Removed and Reinstalled Historic Materials	Contractor shall handle removed and reinstalled historic materials in accordance with the following: • Clean and repair historic items to functional condition adequate for intended reuse. • Pack or crate items after cleaning and repairing. Identify contents of containers. • Protect items from damage during transport and storage. • Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.	Yosemite National Park; Contractor
MM-CR-6 Existing Historic Materials to Remain	The contractor shall protect construction indicated to remain against damage and soiling during historic treatment. When permitted by Contracting Officer, items may be removed to a suitable, protected storage location during historic treatment, and cleaned and reinstalled, as appropriate, to their original locations after historic treatment operations are complete.	Yosemite National Park; Contractor
MM-CR-7 Storage and Protection	When removed from their existing location, contractor shall store historic materials within a weather-tight enclosure where they are protected from wetting by rain, snow, or ground water, and temperature variations. Contractor shall secure stored materials to ensure protection from theft. • Identify removed items with an inconspicuous mark indicating their original location. • Develop a key plan when many similar items are scheduled for removal and reinstallation.	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
MM-CR-8 Exterior Cleaning and Repairing	Contractor shall conduct exterior cleaning and repair of historic structures in accordance with the following: • Proceed with the work only when forecasted weather conditions are favorable. • Not attempt repairs during rainy or foggy weather. Not apply primer, paint, putty, or epoxy when the relative humidity is above 80 percent. Not remove exterior elements of structures when rain is forecast or in progress. • Not perform exterior wet work when the air temperature is below 40 deg F (5 deg C). • Not begin cleaning, patching, or repairing when there is any likelihood of frost or freezing. • Not begin cleaning when either the air or the surface temperature is below 45 deg F (7 deg C) unless approved means are provided for maintaining a 45 deg F (7 deg C) temperature of the air and materials during, and for 48 hours subsequent to, cleaning.	Yosemite National Park; Contractor
MM-CR-9 General Historic Resource Protection	Contractor shall undertake the following historic resource protection measures: • Comply with manufacturer's written instructions for precautions and effects of products and procedures on adjacent building materials, components, and vegetation. • Ensure that supervisory personnel are present when work begins and during its progress. • Protect existing materials during installation of temporary protections and construction. Not deface or remove existing materials. • Obtain Contracting Officer approval prior to Attaching temporary protection to existing construction. • Protect landscape work adjacent to or within work areas as follows: - Provide barriers to protect tree trunks. - Bind spreading shrubs. - Use coverings that allow plants to breathe and remove coverings at the end of each day. Do not cover plant material with a waterproof membrane for more than 8 hours at a time. - Set scaffolding and ladder legs away from plants. • Prior to the start of work or any cleaning operations, test drains and other water removal systems to ensure that drains and systems are functioning properly. • Notify Contracting Officer immediately of drains or systems that are stopped or blocked. Not begin Work of this Section until the drains are in working order. • Provide a method to prevent solids including stone or mortar residue from entering the drains or drain lines. Clean out drains and drain lines that become blocked or filled by sand or any other solids because of work performed on corresponding project. • Protect storm drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
MM-CR-10 Protection During Application of Chemicals	Contractor shall undertake the following during the application of chemicals: • Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm or damage resulting from applications of chemical cleaners and paint removers. • Comply with requirements in Division 01 Section "Temporary Facilities and Controls." • Cover adjacent surfaces with materials that are proven to resist chemical cleaners selected for Project unless chemicals being used will not damage adjacent surfaces. Use covering materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining. • Do not clean surfaces during winds of sufficient force to spread cleaning solutions to unprotected surfaces. • Neutralize and collect alkaline and acid wastes and dispose of outside park boundaries. • Dispose of runoff from chemical operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.	Yosemite National Park; Contractor
MM-CR-11 Protection During Use of Heat-Generating Equipment	Contractor shall comply with the following procedures while performing work with heat-generating equipment, including welding, cutting, soldering, brazing, paint removal with heat, and other operations where open flames or implements utilizing heat are used: • Obtain Contracting Officer's approval for operations involving use of open-flame or welding equipment. - Notification shall be given for each occurrence and location of work with heat-generating equipment. - Obtain the appropriate permit from the park as required. • As far as practical, use heat-generating equipment in shop areas or outside the building. • Before work with heat-generating equipment commences, furnish personnel to serve as a fire watch (or watches) for location(s) where work is to be performed. • Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe. • Remove and keep the area free of combustibles, including, rubbish, paper, waste, etc., within area of operations. - If combustible material cannot be removed, provide fireproof blankets to cover such materials.	Yosemite National Park; Contractor
MM-CR-12 Protection During Use of Heat-Generating Equipment	• Where possible, furnish and use baffles of metal or gypsum board to prevent the spraying of sparks or hot slag into surrounding combustible material. • Prevent the extension of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings. • Inspect each location of the day's work not sooner than 30 minutes after completion of operations to detect hidden or smoldering fires and to ensure that proper housekeeping is maintained. • Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to automatic sprinkler heads, shield the individual heads temporarily with guards.	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
MM-CR-13 Historic Preservation Treatment Procedures	Contractor shall undertake the following historic preservation treatment procedures: • Retain as much existing material as possible; repair and consolidate rather than replace. • Use additional material or structure to reinforce, strengthen, prop, tie, and support existing material or structure. • Use reversible processes wherever possible. • Use traditional replacement materials and techniques if possible. New work shall be distinguishable from old work and original materials and techniques. • Record the existing condition before commencing with repair work; document with preconstruction photos, sketches and field notes. Record repair work during construction with periodic construction photos and daily inspection reporting. Photo documentation is specified in Division 01 Section "Photo Documentation For Historic Preservation Projects". • Prohibit smoking by personnel performing work on or near historic structures. • Notify Contracting Officer of visible changes in the integrity of material or components whether due to environmental causes including biological attack, UV degradation, freezing, or thawing; or due to structural defects including cracks, movement, or distortion. - Do not proceed with the work in question until directed by Contracting Officer. • Where Work requires existing features to be removed, cleaned, and reinstalled, perform these operations without damage to the material itself, to adjacent materials, or to the substrate. • Identify new or replacement materials and features with inconspicuous, permanent marks to distinguish them from original materials. Record the legend of identification marks and the locations of these marks on Record Drawings. • When cleaning, match samples of existing materials that have been cleaned and identified for acceptable cleaning levels. Avoid over-cleaning to prevent damage to existing materials during cleaning. Only the gentlest methods available should be attempted. Initiate cleaning using hand cleaning methods before introducing power cleaning methods and equipment.	Yosemite National Park; Contractor
MM-CR-14 Plan-Specific Programmatic Agreement	Following agreement on the assessment of adverse effect to historic properties, the NPS and relevant consulting parties have engaged in consultation to develop measures to minimize or mitigate adverse effects pursuant to 36 CFR Part 800.6. Where appropriate, the results of that consultation have been documented in the plan-specific Programmatic Agreement (see Appendix I). This agreement may include treatments established by the ACHP under 36 CFR Part 800.14(d) and may also defer to or build upon the 2008 Nationwide PA that streamlines the Section 106 process for actions not affecting or not adversely affecting historic properties. This agreement also diagrams the NHPA review process for actions requiring phased identification and/or phased assessment of adverse effects. Additional minimization and mitigation measures will be developed through this tiered compliance process.	Yosemite National Park
MM-CR-15 Archeological Resources	Train all members of the restoration/construction teams in proper handling of inadvertent discovery of archaeological resources. Training would involve information regarding the types of archeological materials that are likely present in the specific project area, how to identify archeological materials, and the procedures for contacting the appropriate parties in the event that archeological materials are encountered during restoration/construction activities. All restoration/construction personnel would be required to participate in the training, and written guidelines would be prepared and distributed to aid in identification of archeological materials and to inform workers of the procedures to follow in case of a discovery or potential discovery. If buried archeological resources such as flaked stone or groundstone, historic debris, building foundations, midden soils or human bone are inadvertently discovered during ground-disturbing activities, work shall stop in that area and within a 100-foot radius of the find until a qualified archeologist can assess the significance of the find.	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
MM-CR-15 Archeological Resources (cont)	Inadvertent discoveries would be treated in accordance with 36 CFR 800.13 (Protection of Historic Properties: Post-review discoveries). The archeological resource would be assessed for its eligibility for listing on the National Register in consultation with the SHPO and representatives of traditionally associated American Indian tribes and groups (if it is an American Indian archeological site), and a determination of the project effects on the site would be made. If the site would be adversely affected, a treatment plan would also be prepared as needed during the assessment of the site's significance. Assessment of inadvertent discoveries may require archeological excavations and/or archival research to determine resource significance. Treatment plans would fully evaluate avoidance, project redesign, and data recovery alternatives before outlining actions proposed to resolve adverse effects. If human skeletal remains are encountered, protocols under federal and state law would apply. All work shall stop in the vicinity of the discovery, and the find would be secured and protected in place. The appropriate county coroner (Mariposa or Merced) and Park Archeologist would both be immediately notified. If a analyses determine that the remains are American Indian, and that no further coroner investigation of the cause of death is required, the coroner would then be required to contact the NAHC (pursuant to Section 7050.5[c] of the California Health and Safety Code) and the County Coordinator of Indian Affairs. The remains would also be treated in accordance with the Native American Graves Protection and Repatriation Regulations at 43 CFR 10.4 (Inadvertent discoveries).	
MM-CR-16 Ground Disturbance and Testing	Management actions involving moderate to severe ground disturbance (trail reroutes; formalization of social trails; excavations for subsurface utilities; development of campgrounds; removal of abandoned infrastructure and/or facilities, construction of buildings, structures, parking lots, and roads; topographic recontouring; decompaction and plant salvage; and actions that may focus visitor use at areas with sensitive surface resources) within or adjacent to the boundaries of known archeological sites shall be preceded by intensive surface survey and/or controlled subsurface testing, as determined appropriate given past studies and findings. Initial limited testing shall be conducted in the area(s) proposed for ground disturbance, to first determine if the presence of site components can be verified. If so, the methods of achieving the proposed action may be modified and/or relocated, if possible. If effects could not be avoided, archeological treatment measures would be site-specific and contingent on previous studies' results and the level of work proposed.	Yosemite National Park; Contractor
MM-CR-17 Ground Disturbance and Monitoring	A Government provided Archeological Monitor, and as necessary, Native American Monitor, will observe all ground-disturbing site work, including construction of temporary facilities at all culturally sensitive areas, from a safe location mutually agreed on by Contractor, Contracting Officer and Monitors. As new ground is broken, Monitors will examine excavated materials, using construction layout centerline and perimeter staking as a reference point to record locations of findings. Monitoring may also be included as part of a treatment plan for individual resources following initial testing as per MM-AR-2 Prior to construction, mark with flagging all sensitive cultural resources to be protected within the project area identified per the requirements of the plans and specifications. Proper placement of flagging shall be verified by the Contracting Officer. Upon verification, erect necessary fencing to identify and protect cultural resources from disturbance. Do not begin ground-penetrating work such as excavation, trenching, drilling, or stump and root removal in culturally sensitive areas without the presence of Archeological Monitor, and if required, Native American Monitor. The archeological monitor shall record and be authorized to collect soil samples and artifactual/ecofactual material as warranted for analysis. If the monitor determines that any portion of the proposed action could have an adverse effect on the site, alternative methods of accomplishing the action shall be discussed with the restoration personnel. Restoration activities within site boundaries shall be conducted using manual tools rather than mechanized equipment whenever possible, and no stock animals or wheeled vehicles used for transport of workers and tools shall be allowed within 10 meters of the known site boundary. If Archeological Monitor or Native American Monitor discovers resources, immediate relocation of the work to a non-sensitive area may be required to allow Monitors to take soil samples and record resources. While Monitors are documenting resources in sensitive areas, Contractor shall relocate work to non-sensitive areas.	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
MM-CR-17 Ground Disturbance and Monitoring (cont.)	If an Archeological Monitor requires access to a construction area the contractor shall furnish safe access, free from recognized hazards, to enable the monitor to complete his/her duties. This will commonly involve trench access when soil sampling is deemed necessary by the Archeologist. If resources are discovered while Monitors are absent, stop work immediately and report the discovery to the Contracting Officer.	
MM-CR-18 Ground Disturbance and Monitoring	Stop Work: Cease all activities in the area of discovery and protect the resources discovered. In the event the discovery represents human remains or any objects subject to the Native American Graves Protection and Repatriation Act (NAGPRA), the NPS will follow procedures outlined in NAGPRA regulations. This will require a stoppage of work in the area of work for a minimum of 30 calendar days. In the event of an inadvertent discovery of Cultural Resources, be prepared to stop work and continue in other areas. The Contractor shall plan, schedule, and execute the work to prevent stoppages at one area from stopping all work at the construction site.	Yosemite National Park; Contractor
MM-CR-19 Daily work schedule	A Daily Work Schedule is required for all work occurring within archeologically sensitive areas. Include all work that is to occur within the area and key the schedule to the drawings to include the following: 1. Starting and ending dates of ground-disturbing construction. 2. Locations of temporary facilities, such as barriers, field offices, staging areas, sanitary facilities, borrow pits, and haul and access roads. 3. Types of construction, such as clearing, topsoil stripping, structure or trench excavation, landscaping, and post construction clean-up. 4. Methods and equipment used for each type of construction. 5. Plan for relocating work in the event of temporary work stoppages at each archeologically sensitive area 6. A permit is required for any archeological investigations (e.g. excavation, shovel testing, coring, pedestrian survey, underwater archeology, rock art documentation, or other types of reconnaissance including the archaeological monitoring of construction) carried out on parklands by non-NPS personnel, unless carried out under a contract or a cooperative agreement specifically written for archeological investigations. Permits are issued under the Archaeological Resources Protection Act of 1979 (ARPA). The NPS does not issue a permit for archeological investigations carried out by NPS archeologists, or to archeologists working on NPS archeological projects under a contract or cooperative agreement. 7. Applicants should submit a Permit Application (DI Form 1926 (Rev Sept 2004) OMB No. 1024-0037, approved through 1/31/2008 – the Permit Application form is available in pdf format) to the manager of the park in which they propose to work; or to the regional director, with a copy to the park manager.	Yosemite National Park; Contractor
MM-CR-20 Consultation with American Indians	The NPS and traditionally-associated American Indian tribes and groups will continue to collaborate on resources management and historic preservation activities guided by existing cooperative agreements to ensure that adverse effects to historic properties with traditional religious and cultural significance can be avoided.	National Park Service and traditionally-associated American Indian tribes and groups
MM-CR-21 Section 106 Compliance	Identification, evaluation, and assessment of effects to be determined for projects/actions assigned to Category 3 in Exhibit 6 of the 2014 *Programmatic Agreement Among the National Park Service at Yosemite National Park, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation regarding Compliance with Section 106 of the National Historic Preservation Act for the Merced Wild and Scenic River Comprehensive Management Plan.*	National Park Service
MM-CR-22 Inadvertent Discovery of Historic Properties or American Indian Human Remains	In accordance with the 2014 *Programmatic Agreement Among the National Park Service at Yosemite National Park, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation regarding Compliance with Section 106 of the National Historic Preservation Act* for *Merced Wild and Scenic River Comprehensive Management Plan;* protocols and requirements for Inadvertent Discovery of Historic Properties or American Indian Human Remains shall be incorporated into all construction requirements documents (plans and specifications).	National Park Service

APPENDIX C
CUMULATIVE ACTIONS

The Council on Environmental Quality describes a cumulative impact as the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of the agency (federal or nonfederal) or person taking the action. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Each impact topic in Chapter 3 of the *Bridalveil Fall Rehabilitation Environmental Assessment* considers the impacts of each alternative in conjunction with relevant impacts of past, present, and reasonably foreseeable future actions.

PAST ACTIONS

Install Restroom at the Church Bowl Picnic Area in Yosemite Valley

This project replaced four portable toilets with a flush toilet at the Church Bowl Picnic area in Yosemite Valley. The new restroom is about 16 feet x 22 feet with a men's and women's restroom. Each restroom has an accessible fixture and a second fixture (four fixtures total). This project meets current Architectural Barriers Act standards for accessibility. This area sustains moderately high visitor use.

Bridalveil Fall Vault Toilet Ventilation and Interior Lighting System Installation

This 2011 project intended to improve ventilation and interior lighting systems at the vault toilets at the Bridalveil Falls parking, as the existing solar powered system did not have enough sunlight to work efficiently. The park installed thermoelectric generator and 100 gallon propane tank behind the existing vault toilets to serve ventilation fans and LED dome lights for each toilet stall. Storage batteries and a charge controller were also installed. The park later concluded that this project did not substantially improve conditions at the site.

Reconstruct Critically Eroded Sections of El Portal Road

This project reconstructed critically eroded sections of El Portal Road at "the Narrows", the area between the Big Oak Flat Road intersection and Pohono Bridge. The road was at risk of failure where high-water events, including the Merced River flood of January 1997, undercut the road. The prompt reconstruction of the failing portions of El Portal Road protected travelers from a sudden road failure and maintained access to Yosemite Valley. The Finding of No Significant Impact for the project was signed in July 2007. In 2017, the park followed up with pavement rehabilitation and drainage improvements.

Parkwide Emergency Road Repairs

This project repaired storm damage on primary roads in Yosemite National Park in 19 locations. The majority of the damaged was on the El Portal, Big Oak Flat, Valley Loop, and Wawona Roads.The specific repairs included:

- Replacing damaged roadway/pavement.
- Reconstructing sections of the existing stone guardwall and curb.
- Cleaning or replacing culverts and repairing headwalls.
- Removing slide debris from drainages to re-establish the original drainage channels.
- Repaving and regrade road shoulders and stabilize with rock rip rap in multiple areas.

Wawona Road Rehabilitation

This 2009 project pulverized and repaved about 25 miles of the Wawona between Southside Drive in Yosemite Valley and the South Entrance to Yosemite National Park. The existing 24-foot-wide paved road was recycled (pulverized to a maximum depth of 12 inches) and overlaid with subgrade and shoulders as required. Culverts were replaced due to failure. Drainage work also included installation of an underdrain system at about 20 road locations where there is currently a road failure concern. Minimal work took place at pullouts and intersections, within the existing paved footprint.

PRESENT

Merced Wild and Scenic Comprehensive River Management Plan (2014)

The overall goal for the *Final Merced River Plan* is to provide for the public use and enjoyment of the Merced River while protecting and enhancing the values that led to its inclusion in the Wild and Scenic Rivers System. Specific goals of the plan are to:

- *Protect and Enhance Ecological and Natural Resource River Values*. Promote the ability of hydrological and geological processes associated with the Merced River to shape the landscape, restore floodplains and meadows, and protect water quality.
- *Provide Opportunities for Direct Connection to River Values*. Support opportunities to experience and develop direct connections to the Merced River and its unique values as a place of cultural association, education, recreation, reflection, and inspiration.
- *Establish a User Capacity Management Program*. Establish a user capacity management program that provides for public use and enjoyment of the Merced River while protecting and enhancing natural and cultural river values.
- *Determine Land Uses and Associated Developments*. Provide clear direction on land use, facilities, and services within the river corridor that are necessary for public use and provide for the protection of river values.

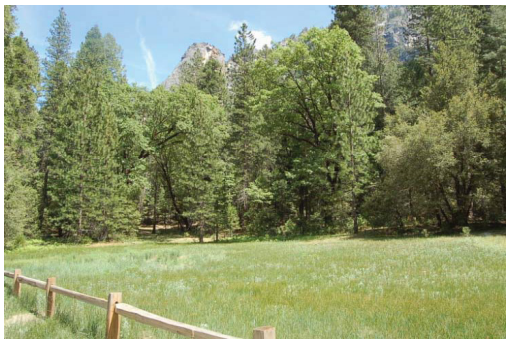
The selected alternative in the Merced River Plan prescribes a suite of actions to achieve these goals over the next 20 years, including the actions described in the *Bridalveil Fall Rehabilitation Project Environmental Assessment*. Actions in Yosemite Valley in the next five years include: improve parking and road circulation including a grade-separated crossing for pedestrians near Yosemite Lodge; improve lodging and parking at Half Dome Village; restore Merced River riverbanks in heavily impacted areas; restore and enhance meadows; enlarge the Camp 4 walk-in campground and Upper Pines campground; and demolish the Art Activity Center in Yosemite Village and restoration to wetland habitat.

The Merced River Plan also prescribes treatments (maintenance clearing) for the following six scenic vistas associated with Bridalveil Fall.

Bridalveil Fall Approach (Southside Drive). The Bridalveil Fall Approach is located on Southside Drive, 0.30 mile east of Pohono Bridge. Southside Drive heads directly to the falls before turning to the east at Bridalveil Meadow. This is one of the first waterfalls visitors see when entering the Yosemite Valley. The current view of the fall is very narrow and only visible along a brief segment of road. Further encroachment of mature trees from the sides of the road could block the view completely. This site contains a large number of cedar, fir, and ponderosa saplings/seedlings that the park would need to remove in the initial management of the site.

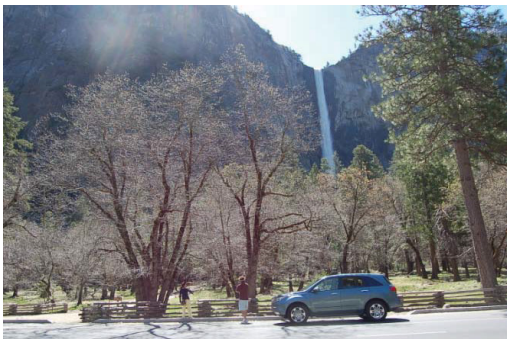
BRIDALVEIL FALL, POINT 1 (SOUTHSIDE DRIVE)

Roosevelt Turnout. The Roosevelt Turnout is located 0.45 mile east of Pohono Bridge. The focal point of the Roosevelt Turnout is Bridalveil Fall, with a portion of Bridalveil meadow in the foreground. This sign commemorates the general location of where John Muir and Theodore Roosevelt camped in 1903. Many conifers obscure the view Bridalveil Fall.



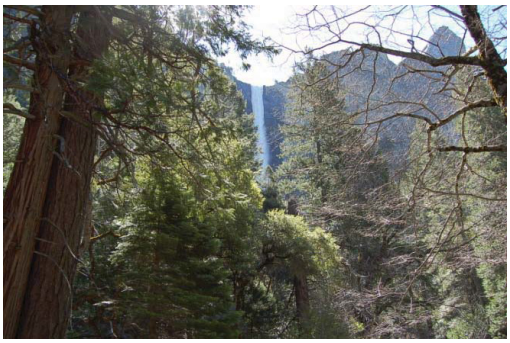
ROOSEVELT TURNOUT

Bridalveil Straight, Interpretive Sign. The Bridalveil Straight Interpretive Sign is located 0.25 mile east of the intersection of Southside Drive and Wawona Road. This vista is listed as a contributing feature to the Yosemite Valley Historic District. Bridalveil Fall to the south is the focal point of the vista. This location also has a spectacular view of El Capitan to the east, over California Black Oaks. Bridalveil Fall View, Hanging Valley Interpretive sign-work has started at this site, but is not complete.



BRIDALVEIL STRAIGHT, INTERPRETIVE SIGN

Bridalveil Fall Foot Bridge. The Bridalveil Fall Foot Bridge is located on the Bridalveil Fall Trail below the fall. This vista is from one of three bridges built in 1913 at the waterfall. These are the oldest remaining bridges in the valley. Bridalveil Fall footbridge-work has started at this site, but is not complete.



BRIDALVEIL FALL FOOT BRIDGE

Bridalveil Fall View, Hanging Valley Interpretive Sign. The Hanging Valley Viewpoint is on Northside Drive, approximately 1 mile west of El Capitan Crossover. The viewpoint gives visitors views across the Merced River to Bridalveil Fall and the Leaning Tower. This viewpoint is a contributing vista to the Yosemite Valley Historic District. The vista includes a stand of California Black Oaks. Valley View work has started at this site, but is not complete.

BRIDALVEIL FALL VIEW, HANGING VALLEY INTERPRETIVE SIGN
(PHOTO CREDIT: STEVE BUMGARDNER)

Valley View. Valley View is at the west end of Northside Drive, before Pohono Bridge. This is the vista on the 2010 quarter from the U.S. Mint's "America the Beautiful" series. The viewpoint is part of the Yosemite Road Guide (marker V11) which describes it as being a view of the "gates" of Yosemite with El Capitan on the left and Cathedral Rocks on the right. Reflected in the calm water of the Merced River is the landscape of the surrounding Yosemite Valley.

VALLEY VIEW

Invasive Plant Management Plan Update

There are over 150 non-native plant species in Yosemite National Park, which add up to about 10% of the park's total flora. High-priority species targeted for control in Yosemite include Himalayan blackberry, yellow star thistle, spotted knapweed, perennial pepperweed, French broom, tree-of-heaven, and black locust. Crews remove plants with a variety of techniques. Crews re-visit treated areas each year to assess the results and provide follow-up treatment. The park completed an updated plan and signed a Finding of No Significant Impact in 2011.

Rehabilitate the Yosemite Valley Loop Road

The purpose of this project is to repair and resurface existing roadways in Yosemite Valley. The park completed about 70% of the work on the Yosemite Valley Loop Road in the period from 2006 to 2008. The park is finishing remaining work in 2017/2018. The project will improve pavement, improve drainage, and define roadside parking throughout the project area. No widening or realignment of the roadway prism will take place. Areas with soft or poorly draining subgrade will be excavated and replaced with foundation materials. A Finding of No Significant Impact (FONSI) was signed by the Regional Director in February 2006.

Restoration of the Mariposa Grove of Giant Sequoias

Nearly 150 years after U.S. Congress passed landmark legislation preserving both the Mariposa Grove of Giant Sequoias and Yosemite Valley, the park is undertaking comprehensive suite of actions to ensure that the Mariposa Grove ecosystem continues to thrive and provide inspiration and enjoyment for future generations. The primary goals of this project are to restore degraded habitat and natural processes critical to the long-term health of the Grove and improve the overall experience for visitors.

Most public parking will move from the lower Grove to the park's South Entrance, which will serve as the primary transit hub and location for shuttle access. The park will provide new visitor services at the South Entrance including visitor information and restrooms. The park released a Final Environmental Impact Statement in October 2013 with a subsequent Record of Decision in December 2014.

Scenic Vista Management Activities

The purpose of the *Scenic Vista Programmatic Management Plan for Yosemite National Park* is to develop a systematic program to protect and restore Yosemite's important viewpoints, vistas, and the natural processes that sustain the views. The 2010 Finding of No Significant Impact for the *Scenic Vista Management Plan* did not include actions inside the Merced River corridor. Instead, the Merced River Plan included scenic vista clearing actions in the river corridor, which calls for removal of moderate to large conifers to enhance views.

REASONABLY FORESEEABLE FUTURE

Construct a Comfort Station West of Yosemite Lodge at the Yosemite Falls Parking Area

This project will construct one new visitor comfort station at the west end of the Yosemite Lodge, in a previously disturbed area. The proposed new comfort station will help accommodate the visitor needs associated with an adjacent shuttle bus stop and the Yosemite Falls parking area.

The square footage and design features of the comfort station are to include up to seven urinals, 22 toilets and 13 sinks split between the men and womens' sides; along with a family restroom with two toilets and two sinks. Each side will include at least one accessible toilet and sink. The building will

have up to three drinking fountains with water bottle filling capability. The construction will be completed on-site with sustainable materials, energy-efficient interior lighting, and shielded, downward exterior lighting to enhance night skies. All design work will be completed in accordance with the park's design guidelines for Yosemite Valley and Architectural Barriers Act Accessibility Standards. This action was identified in the *Merced River Plan* / *Record of Decision* (2014).

Implement a Day-Use Reservation System for Tour Buses in Yosemite

Tour bus operators with a Commercial Use Authorization to operate in Yosemite are free to bring in multiple tour buses, as long as they comply with the regulations in the special use permit. Currently, buses in Yosemite Valley are restricted to parking in 22 spaces at the Yosemite Falls parking lot. A reservation system for bus parking at this location is proposed for 2019. This reservation system will stagger tour bus arrivals at locations in Yosemite and provide a higher confidence for tour bus drivers that they will have a place to park.

Replace a Modular Comfort Station and Construct a New Comfort Station at Yosemite Village Parking Areas

This project will construct a comfort station at the Yosemite Village parking area (south) and in the vicinity of the Village Store parking area (north). The Yosemite Village Parking area (south) comfort station will replace a modular unit. The park redesigned and constructed the Yosemite Village Parking Area (south) in 2017, leaving a pad for the new comfort station. The permanent comfort station will have about 20 toilets on the womens' side and 5 toilets and 9 urinals on the mens' side. The north comfort station in the vicinity of the Visitor Store will not exceed 800 square feet with about half the number of fixtures as in the south lot. All design work will be completed according to Yosemite's "A Sense of Place" design guidelines for Yosemite Valley and Architectural Barriers Act Accessibility Standards.

Wawona Wastewater Treatment System Project

This project will upgrade the 30-year old wastewater treatment facility in Wawona and connect it to the Wawona Campground. The project will replace a single-stall vault toilet at the South Fork Picnic Area with a flushing toilet facility. The National Park Service initiated an environmental assessment for this project in 2017.

APPENDIX D
DRAFT FLOODPLAIN STATEMENT OF FINDINGS
BRIDALVEIL FALL REHABILITATION PROJECT
YOSEMITE NATIONAL PARK

INTRODUCTION

The National Park Service (NPS) has prepared the *Bridalveil Fall Rehabilitation Project Environmental Assessment* (*EA*) to improve visitor facilities and services at the base of Bridalveil Fall in Yosemite Valley. The purpose of this Floodplain Statement of Findings is to review the *Bridalveil Fall Rehabilitation Project EA* in sufficient detail to:

- Provide an accurate and complete understanding of the risks to human health and safety assumed by implementation of the preferred alternative.
- Provide an analysis of the risks to property in the project area and the comparative flood risk among the alternatives.
- Describe the effects on floodplain values associated with the preferred action.
- Provide a description and evaluation of mitigation measures to reduce impacts to the floodplain.

Floodplains and Floodplain Extent

Following NPS Guidelines (NPS Director's Order 77-2), the Regulatory Floodplain for the proposed action at this site is the 100-year floodplain (1% annual chance of inundation). Currently, there are no defined 100-year and 500-year floodplain boundaries in the Bridalveil Fall project area (including Bridalveil Creek and associated ephemeral and intermittent drainages). For the purposes of this document, the NPS assumes that current and proposed facilities are located in the 100-year floodplain, per NPS Procedural Manual 77-2: Floodplain Management (update 2004).

GENERAL CHARACTERISTICS OF FLOODING IN THE AREA

Flooding in the Bridalveil Fall project area can be categorized as one of two general types: (1) *Spring floods* that occur as a result of spring and summer snowmelt and associated runoff, and (2) *Winter floods* or *rain on snow events* that occur during the late fall and winter (September through April) as a result of intense rainfall or rainfall on snow. From 1916 through 1989, 124 of the 140 recorded high flows in Yosemite Valley were spring floods that occurred in response to spring or early summer snowmelt conditions (Madej et al. 1994). Only about 10% of total floods in the park are winter floods or rain on snow events. However, these events are responsible for the highest floods recorded, especially where warm heavy rains fall on snow in higher elevations. Frazil ice, while less common, occasionally forms at the base of Bridalveil Fall and is another cause of flooding within the park. Frazil ice forms when mist from the waterfall freezes in the air and accumulates at the base of a waterfall. Accumulations of frazil ice can be many feet thick, and when the ice is entrained in the flow, it can cause localized impoundments and other flooding.

At the beginning of the wet season the ground is extremely dry, and about 3 to 5 inches of precipitation is required to satisfy the retention storage capacity of the soil before any significant runoff occurs. Later in the season, when the ground may be very wet and there may be a moderate snow cover at the higher elevations, heavy rainfall over the basin can cause large flood runoff. An intense storm with a high freezing level may also result in flood runoff from almost the entire basin, with as much as 2 inches of snowmelt augmenting the rainfall by up to 20%, based on historic measurements. Most of the runoff from the Merced River basin occurs from November through July (Madej et al. 1994).

Floodplain Attributes of Bridalveil Creek and the Merced River in Yosemite Valley

Bridalveil Creek is a tributary to the Merced River in Yosemite Valley. Bridalveil Creek descends over Bridalveil Fall and flows northwest from the base of Bridalveil Fall through the project area. At the base of the fall, Bridalveil Creek forms multiple braided stream channels as it descends a steep debris flow fan. The stream system, including the perennial Bridalveil Creek, multiple intermittent and ephemeral channels, and associated floodplains, make up the core of the Bridalveil Fall project area.

The gradient of Bridalveil Creek decreases as it reaches the edge of the project area at Southside Drive. The project area does not include the confluence of Bridalveil Creek with the Merced River, which is approximately 600 feet downstream of the project area boundary (Figure 1). The northernmost tip of the Bridalveil Fall project area is located within the 100-year floodplain of the Merced River.

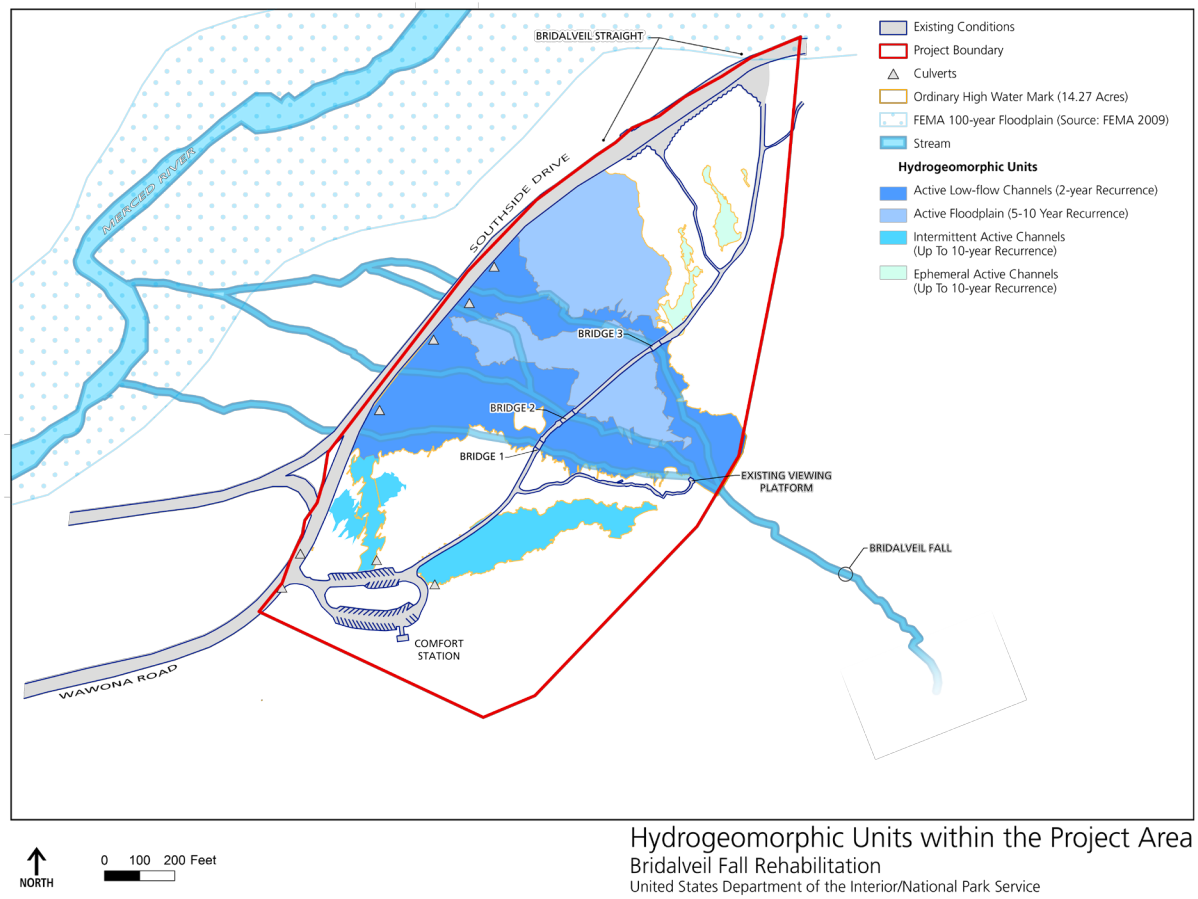


Figure 1. Hydrogeomorphic Units in the Bridalveil Fall Project Area

Most of the Merced River in Yosemite Valley has a well-developed, relatively wide floodplain with an average slope of 0.1%. In the Bridalveil Fall area near the confluence with Bridalveil Creek, the river channel is steeper and more confined, the floodplain is narrow, and flow velocities are high. The largest documented flood events occurred in 1937, 1950, 1955, and 1997, with peak discharges measured in the range of 22,000 to 25,000 cubic feet per second at Pohono Bridge. These floods were the result of rain-on-snow events. Several large undocumented events also occurred during the 1860s and 1870s.

The January 1997 flood was the largest recorded flood within the park with a peak discharge of 25,000 cubic feet per second at Pohono Bridge (Eagan 1998). The flood inundated roads, picnic areas, park offices, and lodging units. It caused extensive damage to NPS facilities, including roads, bridges, buildings, and Yosemite Valley's electric, water, and sewer systems. The flood also altered natural features and caused downed trees, movement of landslide talus into streams, channel erosion, and substantial changes in channel morphology (NPS 1997). This flood was estimated to have a recurrence interval of 90 years (NPS 1997), or about a 1.1% chance of occurring in any given year.

POTENTIAL RISKS TO HUMAN HEALTH AND SAFETY

Floods of consequence in the Bridalveil Fall area and Yosemite Valley always occur with some warning. Flooding within Yosemite Valley typically requires a prolonged period of intense rain for at least 24 hours to create extreme flood conditions. The NPS and other agencies have a comprehensive monitoring system in place to provide an early warning system for major flooding, which provides sufficient time for evacuation.

Pedestrian access to the Bridalveil Fall project area is subject to flooding due to extreme weather events. Flooding may also impact facilities such as roads, trails, bridges, and utilities that provide access to or service the project area. When necessary, the NPS will close areas within Yosemite including the Bridalveil Fall project area to mitigate risks to human life due to flooding. Early warning, evacuation, and closure of the area would mitigate risks to humans in the Bridalveil Fall area.

POTENTIAL RISKS TO PROPERTY

Since 1916, Yosemite National Park has experienced 11 winter floods large enough to cause damage to property. This section describes the existing and proposed new structures in the 100-year floodplain described under the preferred alternative in the Bridalveil Fall Rehabilitation project, and associated risks to property and potential new capital investment.

The NPS categorizes buildings and facilities into the following three categories to evaluate floodplain risks (per NPS Director's Order 77-2 and Procedural Manual 77-2):

- *Class I Actions* include the location or construction of administrative, residential, warehouse, and maintenance buildings and non-excepted (overnight) parking lots, if they lie within the 100-year floodplain.
- *Class II Actions* create "an added disastrous dimension to the flood event." Class II actions include the location or construction of schools, clinics, emergency services, fuel storage facilities, large sewage treatment plants, and structures such as museums that store irreplaceable records and artifacts, if they lie within the 500-year floodplain.
- *Class III Actions* include Class I or Class II Actions that are located in high hazard areas such as those subject to flash flooding.

The following existing or proposed new structures in the preferred alternative of the *Bridalveil Fall Rehabilitation EA* constitute Class I Actions (Figure 2) (see also Figure 2-3 in the *Bridalveil Fall EA*):

- **New accessible pedestrian path to a viewing platform.** The NPS would construct a new accessible path to the existing viewing platform. Most of the path would be at ground level, with the exception of elevated segments that cross small drainages. The park would construct the accessible pathway using robust building materials including natural stone, making it flood resistant.

  The path is located outside the 2-10 year floodplain. Flood depths at this location during a larger flood event are expected to be low, with high flood velocities due to the steepness of the grade as you approach the fall. Elevated segments of the path could sustain damage

during extreme flood events. The need to repair elevated portions of the path after extreme flood events is expected to be moderate.

- **Expanded viewing platform.** The NPS would expand the existing viewing platform from 400 square feet to approximately 1,500 square feet to accommodate more visitors. The platform is located near the base of Bridalveil Fall, on the edge of the ordinary high water mark and 10-year floodplain boundary. Flood velocities and depths at this location would be high during extreme flood events.
  The viewing platform would be replaced and expanded in its current location. The new viewing platform would be constructed of robust materials suitable for the site conditions. The finished elevation of the new viewing platform surface would be between 4 inches and 18 inches above the existing viewing platform elevation. The expanded portion of the platform would be outside of the bed and banks of Bridalveil Creek. The platform could sustain damage during extreme flood events, though the need for repair would be rare. The railing would be designed to be flood resistant, though it could be damaged from falling boulders during extreme events. The viewing platform would require maintenance clearing after high flood events.
- **Parking lot improvements.** The NPS would reconfigure the existing parking lot, without expanding the existing footprint. The parking lot location is outside of main floodways such as Bridalveil Creek. Flood depths in this location during a large flood event are expected to be low, with low flood velocities. The existing parking lot has withstood multiple large flood events with minor damage. Repairing the culvert in the northeast corner of the parking lot is expected to substantially improve drainage through the area and prevent future water-caused erosion. The parking lot provides critical services to that area and there will be no flood-related risks to capital investments for parking lot improvements in this location

Actions along Bridalveil Straight (reconfigured parking, construction of a visitor gathering and viewing area, and reconfigured or paved trails) are considered excepted actions and do not require evaluation in this Statement of Findings because they are outside or above the floodplain and Bridalveil Straight is a non-high hazard area. Improvements to the historic Carriage Road are considered excepted actions for the Floodplain Statement of Findings. The Carriage Road Trail is a cornerstone to visitor circulation within the project area. The trail will not be removed because it is an important contributing element to the Yosemite Village Historic District, and its removal or demolition would result in an adverse effect on this historic resource.

There are no Class II or Class III actions proposed in the Bridalveil Fall project under any of the alternatives.

Alternatives Considered

The *Bridalveil Fall Rehabilitation Project EA* considered one action alternative, Alternative 2, in addition to the preferred alternative considered in this Statement of Findings. Alternative 2 proposes additional facilities in the floodplain – a pedestrian bridge across Bridalveil Creek from the viewing platform near the base of the fall and an additional comfort station along Bridalveil Straight. The additional comfort station would be located in a non-high hazard area, outside deep flood flows and high velocities. The bridge across Bridalveil Fall would require additional Statement of Findings analysis to determine impacts on capital investment. The No Action alternative, Alternative 1, evaluated existing conditions in the area with no additional structures in the floodplain. The No Action alternative would not meet the purpose and need of the project.

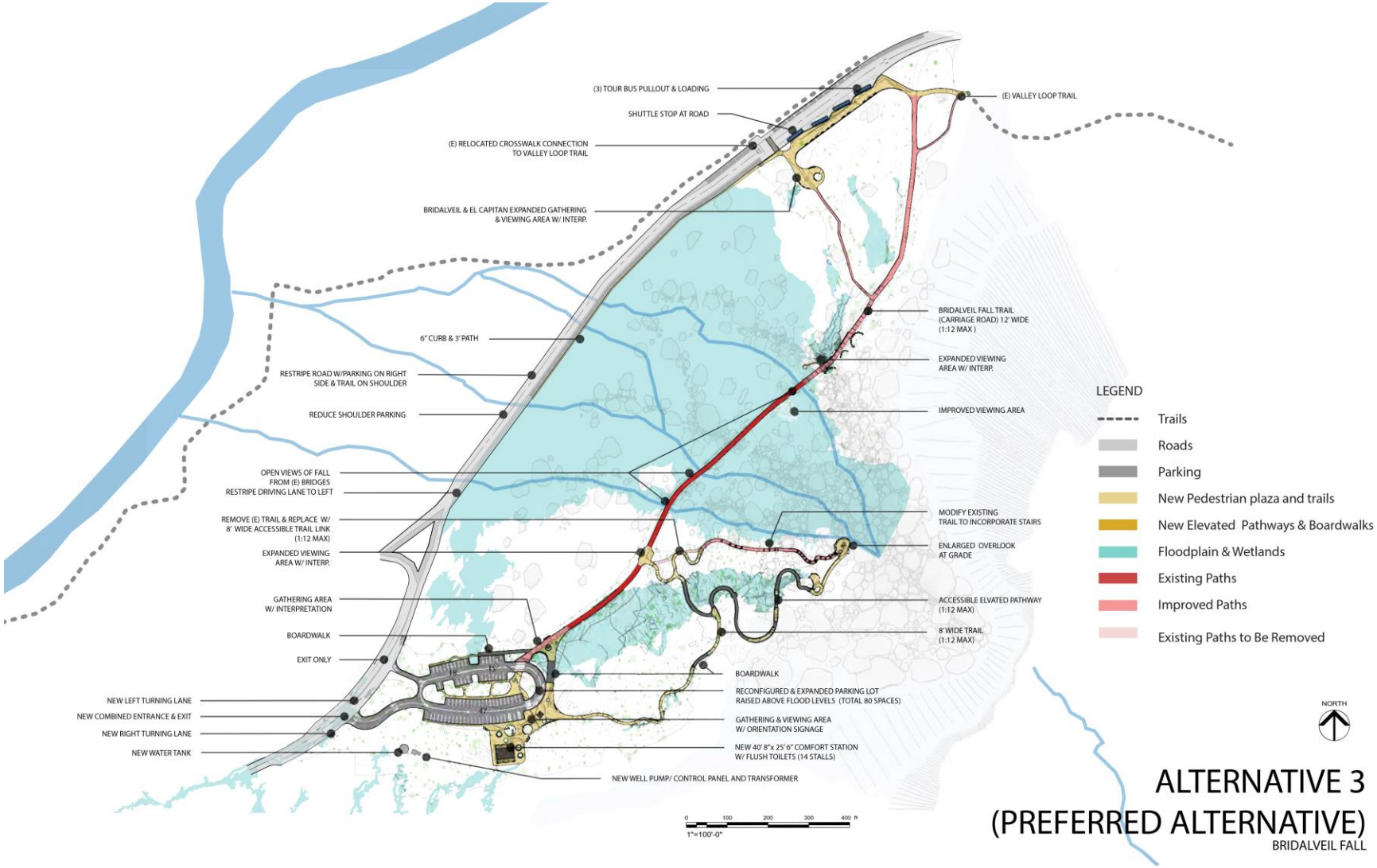


Figure 2. Preferred Alternative in Bridalveil Fall Rehabilitation Project EA

POTENTIAL RISKS TO FLOODPLAIN VALUES

Floodplains provide an array of natural and physical resource values within Yosemite. These values include habitat for vegetation and wildlife, periodic disturbance to habitats within floodplains, which can support ecological value and spatial diversity in habitat, dissipation of flood energy, and benefits to waterway hydrologic processes including fluvial transport mechanisms and river geomorphic processes. The floodplain also recharges groundwater in areas where soils are sufficiently pervious.

Construction of the new comfort station with flush toilets at the parking lot would substantially improve natural resource conditions and water quality in the parking lot area. Considerable human waste is present near the parking lot, as visitors search for alternatives to long lines and disagreeable conditions at the existing vault toilets. The park expects the presence of human waste to diminish greatly after construction of the new flush toilets.

Reconfiguration of the parking lot would have no impact on floodplain values, as the park would reconfigure the parking lot in roughly the same footprint. Culverts would be repaired in the northeast corner of the lot and the new trailhead boardwalk configuration will restore flows off the parking lot in a more natural pattern. Raising the northeast part of the parking lot about 18 inches would aid in moving flowing water back to natural water drainages.

The new accessible pedestrian path to a viewing platform would be raised over drainages, preserving natural flow patterns in the area and avoiding wetland vegetation. There is considerable off-trail foot traffic in this area, which tramples native vegetation and habitat. The trail will confine use to one path and may reduce off-trail use.

While the expanded portion of the viewing platform would not extend into the bed and banks of Bridalveil Creek, a small portion of the existing platform extends into the bed and banks. Creek flows do not reach the platform at low flows. During moderate and high flows, the platform would not substantially impact flows more than the existing boulders and trees in the very rough alluvial fan environment.

DESIGN OR MODIFICATIONS TO MINIMIZE HARM TO FLOODPLAIN VALUES OR RISKS TO LIFE AND PROPERTY

The design of all new structures or substantial improvements to existing structures will incorporate requirements and methods for minimizing flood damage. Park staff will maintain an active flood evacuation plan. The plan details responsibilities of individual park employees for advanced preparedness measures; removing or securing park property; records and utility systems; monitoring communication; and conducting rescue and salvage operations. Impacts on the site's resources will be minimized and avoided per Mitigation Measures in the environmental assessment.

Site-Specific Mitigation

- Active flood plans will be in place for timely and safe evacuation of people in times of rising water. Areas will be evacuated prior to major storm events that could potentially produce flooding, based on ongoing monitoring within the Park. Risks to humans will be mitigated by monitoring of storm or potential storm conditions, warning, and evacuation as warranted.

CONCLUSION

Implementation of the preferred alternative in the *Bridalveil Fall Rehabilitation Project EA* will take place in compliance with regulations and policies to prevent impacts to floodplain values and loss of human life or property. The park and contractors will strictly adhere to mitigation measures during

and after construction activities. Individual permits with other agencies will be obtained prior to construction activities. The NPS concludes that there will be no unacceptable risks to human health and safety, unacceptable impacts to property, or substantial long-term adverse impacts to floodplain values. Therefore, the NPS finds the preferred alternative in the *Bridalveil Fall Rehabilitation Project EA* to be acceptable under Executive Order 11988 and the NPS Directors Order 77-2 for the protection of floodplains.

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1994 Analysis of Bank Erosion on the Merced River, Yosemite Valley, Yosemite National Park, California, USA. Environmental Management Vol 18, Issue 2, pp 235-250. March.

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1997 EFRO Report, Yosemite National Park, Highwater 97. April.

Appendix E.

Table E-1. Special Status Wildlife Species Potentially Occurring in Yosemite Valley

Species	Federal Status	State Status	Habitat	Potential to Occur in the Project Area
Amphibians				
Yosemite toad (*Anaxyrus canorus*)	T	SSC	Thick meadow vegetation and patches of low willows, usually in shallow, warm water areas in habitats surrounded by lodgepole or whitebark pine from 6,400-11,300 feet elevation.	Not expected to occur in project area due to habitat requirements; Yosemite toad generally occur above 6,000 feet.
Mount Lyell salamander (*Hydromantes platycephalus*)	none	WL	Largely restricted to alpine or subalpine vegetation associations in outcrops of rocks and boulders with free surface water, such as a stream, waterfall, or melting snow nearby.	Known to occur in Yosemite Valley, and potential habitat occurs within the project area.
foothill yellow-legged frog (*Rana boylii*)	none	SSC	Primarily found in streams with riffles, rocky substrates, and open banks from sea level to 6,400 feet in elevation.	The species was historically present in the valley, but it is believed to have been extirpated from Yosemite National Park
California red-legged frog (*Rana draytonii*)	T	SSC	Found mainly near ponds in forests, woodlands, grasslands, coastal scrub, and streamsides with plant cover. Most common in lowlands or foothills. Breeding habitat is in permanent or ephemeral water sources; lakes, ponds, reservoirs, slow streams, marshes, bogs, and swamps.	The species is believed to have been extirpated from Yosemite National Park. However, efforts are currently underway to reintroduce the species to the park. NPS, in conjunction with the USFWS, is reintroducing 4,000 tadpoles and 500 adults between 2017 and 2019 into several sites in east Yosemite Valley. It is highly unlikely that individuals would travel to the Bridalveil Fall project area before construction is complete.
Sierra Nevada yellow-legged frog (*Rana sierrae*)	E	T, WL	Typically found along lakeshores and low gradient streams with irregular shores as low as 4,500 feet, but generally from 6,000 to over 12,000 feet in elevation.	Not expected to occur in project area due to habitat requirements; Sierra Nevada yellow-legged frog generally occur above 6,000 feet.

Table E-1. Special Status Wildlife Species Potentially Occurring in Yosemite Valley

Species	Federal Status	State Status	Habitat	Potential to Occur in the Project Area
Birds				
northern goshawk (*Accipiter gentilis*)	MBTA	SSC	Mature and late-seral forest; moderate to closed canopy with open understories; at least two canopy layers. Typically nests in mature conifer stands near streams.	Potential foraging, roosting, and nesting habitat may occur within or adjacent to project area.
golden eagle (*Aquila chrysaetos*)	BGEPA, BCC, MBTA	FP, WL	Found in a wide range of elevations in the park. Needs open terrain for hunting. Nests on cliffs and in large trees in open areas.	Possible roosting/nesting habitat in project area.
long-eared owl (*Asio otus*)	MBTA	SSC	Primarily inhabits riparian and live oak woodlands and thickets in association with open grassland, meadow, or agricultural foraging habitats. Also occasionally uses high elevation coniferous forests, but only in association with large open grasslands or scrublands.	No recent records exist. Unlikely to occur in project area.
Vaux's swift (*Chaetura vauxi*)	MBTA	SSC	A rare summer resident from 4,000 to 7,000 feet on west slope of the Sierra Nevada. Often associated with old-growth forests where standing, hollow snags afford suitable nesting and roosting sites.	Transient individuals may occur in project area.
northern harrier (*Circus cyaneus*)	MBTA	SSC	Nests on the ground. Favor open areas such as grasslands, meadows, wetlands, and agricultural clearings.	Rarely seen migrant in Yosemite Valley meadows. No habitat occurs in the project area.
olive-sided flycatcher (*Contopus cooperi*)	BCC, MBTA	SSC	Inhabits late-successional conifer forests with open canopies (e.g., 0–30% canopy cover); primarily in open mixed-conifer and red fir.	Common Yosemite resident, often observed in the Valley. Possible transient occurrence in project area.
black swift (*Cypseloides niger*)	BCC, MBTA	SSC	A fairly common summer resident from 4,000 to 7,500 feet and a rare transient at higher elevations on west slope of the Sierra Nevada. Nests behind waterfalls and on steep cliffs. Potentially more than a third (roughly 80 pairs) of the breeding population is in the Mariposa County portion of the park.	Known to occur in project area and potential nesting habitat exists.

Table E-1. Special Status Wildlife Species Potentially Occurring in Yosemite Valley

Species	Federal Status	State Status	Habitat	Potential to Occur in the Project Area
yellow warbler (*Dendroica petechia*)	BCC, MBTA	SSC	Breeds in wet, deciduous thickets, especially willows, also shrubby areas and old fields.	In recent decades, numbers of breeding pairs have declined dramatically in Yosemite National Park. Known to breed in the Valley. Transient individuals may occur in project area.
willow flycatcher (*Empidonax traillii*)	BCC, MBTA	E	Riparian thickets along streams, rivers, lakes, springs, wet meadows, mountainside seepages; often with standing or running water.	Last recorded in Yosemite Valley in 1974. No habitat occurs within the project area.
peregrine falcon (*Falco peregrinus*)	BCC, MBTA	FP	Can be found hunting over a variety of habitats. Nests on cliffs and steep, rocky habitats.	Known to occur in Yosemite Valley. Potential nesting habitat and transient occurrence in project area.
bald eagle (*Haliaeetus leucocephalus*)	BGEPA, BCC, MBTA	E, FP	Mature conifer forest near large bodies of water.	Nesting is known to occur in the park. Possible transient occurrence in project area.
harlequin duck (*Histrionicus histrionicus*)	MBTA	SSC	Breeding range includes Sierra Nevada. Breeds along clear, fast-flowing rivers and streams with substantial streamside vegetation.	No habitat occurs within project area. Unlikely to occur in project area.
great gray owl (*Strix nebulosa*)	MBTA	E	Conifer forest adjacent to montane meadows and other openings. Entire California population of this species is restricted to the Yosemite region, where it reaches southernmost extent of its North American range.	Not known to occur in Yosemite Valley. Unlikely to occur in project area.
California spotted owl (*Strix occidentalis occidentalis*)	BCC, MBTA	SSC	Breeds in oak and ponderosa pine forests upslope to lower elevation red fir forests (up to elevations of 7,600 feet), with mixed conifer the optimum type. Presence of California black oak in the forest canopy also enhances habitat suitability.	Sightings in Yosemite Valley have been sporadic. Potential habitat occurs in and in the vicinity of the project area.
Mammals				
pallid bat (*Antrozous pallidus*)	none	SSC	Primarily found below 6,000 feet in elevation, in a variety of habitats, especially oak, ponderosa pine, and giant sequoia habitats. Roosts in rock outcrops, caves, hollow trees, and man-made structures.	Roosting sites recorded within Yosemite Valley. Habitat may occur within or adjacent to project area.

Table E-1. Special Status Wildlife Species Potentially Occurring in Yosemite Valley

Species	Federal Status	State Status	Habitat	Potential to Occur in the Project Area
Sierra Nevada mountain beaver (*Aplodontia rufa californica*)	none	SSC	Generally found in association with moist meadows and montane riparian habitat and occasionally with open, brushy stages of most forest types in the Sierra Nevada.	Confirmed observations in the Merced River corridor and Yosemite Valley. No habitat occurs within project area.
Townsend's big-eared bat (*Corynorhinus townsendii*)	none	SSC	Majority of records are from low to moderate elevations, though the species has been found to almost 9,000 feet. Uses caves, mines, or buildings for roosting. Prefers mesic habitats where it gleans from brush or trees along habitat edges.	Habitat may occur within or adjacent to the project area.
spotted bat (*Euderma maculatum*)	none	SSC	Occurs in montane coniferous stands and roosts in caves, abandoned mines, buildings, cracks, and crevices in cliffs and canyons, often near wetlands or water.	Rare throughout range, but relatively abundant in Yosemite. Suitable roosting and/or foraging habitat may occur within or adjacent to project area.
western mastiff bat (*Eumops perotis californicus*)	none	SSC	Found in a variety of habitats to over 9,800 feet in elevation. Roosts primarily in crevices in cliff faces, and occasionally trees. Detected most often over meadows and other open areas, but will also feed above forest canopy; sometimes to high altitudes (10,000 feet).	High population in Yosemite Valley. Suitable foraging and roosting habitat may occur within and adjacent to project area.
North American wolverine (*Gulo luscus*)	PT	T, FP	Various habitat types used, coniferous forests, subalpine and alpine areas above 8,000 feet; requires areas with persistent, deep snow cover.	No known nearby extant populations, no recent records of occurrence, and not expected to occur due to existing levels of disturbance in the study area.
western red bat (*Lasiurus blossevillii*)	none	SSC	Roosts in foliage. Breeding females appear to be highly associated with low elevation riparian habitats and are most often observed in the Central Valley and southern coastal areas. Individuals (most likely males or non-reproductive females) have been documented up to 7,500 feet in the Sierra Nevada.	Suitable foraging habitat may occur within or adjacent to project area.

Table E-1. Special Status Wildlife Species Potentially Occurring in Yosemite Valley

Species	Federal Status	State Status	Habitat	Potential to Occur in the Project Area
Sierra Nevada snowshoe hare (*Lepus americanus tahoensis*)	none	SSC	Primarily found in montane riparian habitats with thickets of alders and willows, and in stands of young conifers. Early seral stages of mixed conifer, subalpine conifer, red fir, Jeffrey pine, lodgepole pine, and aspen are likely snowshoe hare habitats, primarily along edges and especially near meadows	Suitable habitat likely occurs in the project area, but low potential to occur as the species prefers dense streamside vegetation.
western white-tailed jackrabbit (*Lepus townsendii townsendii*)	none	SSC	Inhabits a variety of habitats, including sagebrush, perennial grasslands, alpine dwarf-shrub, and wet meadows to timberline and above, and early successional stages of a variety of conifer habitats including lodgepole pine, yellow pine, western juniper, dwarf juniper, red fir, and mixed conifers.	Not likely to occur because of lack of occurrence in the vicinity of the project area.
Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*)	E	E, FP	Alpine and sub-alpine zones with steep, rocky terrain. Occurs primarily along the Sierra Crest in the northeast portion of the park. Most of the herd inhabits U.S. Forest Service land adjacent to the park.	Not likely to occur in project area.
fisher, West Coast DPS (*Pekania pennanti*)	PT	CT, SSC	Late seral, closed canopy coniferous forests. Solitary and apparently needs large areas of mature forests with a high percentage of canopy closure, free of human disturbance.	Potential habitat occurs, but no recent nearby records. Marginal potential to occur due to existing levels of disturbance in the study area.
Mount Lyell shrew (*Sorex lyelli*)	none	SSC	Observed only in the vicinity of Mount Lyell, within or near Yosemite. Favors moist areas near streams, in grass, or under willows.	Not expected to occur in the project area.
American badger (*Taxidea taxus*)	none	SSC	Open areas and brushlands with little groundcover. Usually found in relatively dry grasslands and open forests. May be active at any hour but are mainly nocturnal.	Low potential because of lack of preferred habitat.
Sierra Nevada red fox, Sierra Nevada DPS (*Vulpes vulpes necator*)	C	T	Subalpine forest and meadow. Found mostly above 7,000 feet and rarely below 5,000 feet elevation.	No confirmed observations in Yosemite Valley. Unlikely to occur within the project area.

Table E-1. Special Status Wildlife Species Potentially Occurring in Yosemite Valley

Species	Federal Status	State Status	Habitat	Potential to Occur in the Project Area
Reptiles				
western pond turtle (*Actinemys (Emys) marmorata*)	none	SSC	Ponds, marshes, rivers, streams, and ditches to an elevation of about 6,700 feet, but are uncommon anywhere above 5,000 feet. Prefers open, grassy south-facing slopes for nest sites.	The species was believed to have been extirpated from Yosemite Valley. Efforts are currently underway to reintroduce the species to the park. Reintroduced western pond turtles are being monitored using radio telemetry and are currently less than 1.5 miles from project area. It is possible that they could occur within the project area.

Sources: CDFW 2017a, b; NPS 2014a, b; USFWS 2017

Abbreviations: BCC = bird of conservation concern, BGEPA = Bald and Golden Eagle Protection Act, MBTA – Migratory Bird Treaty Act, C = candidate, CT = candidate threatened, DPS = distinct population segment, E = Endangered, FP = fully protected, PT = proposed threatened, SSC = species of special concern, T = threatened, WL = watch list.

APPENDIX F
DRAFT NATIONAL HISTORIC PRESERVATION ACT ASSESSMENT OF EFFECT FOR SITE-SPECIFIC ACTIONS BRIDALVEIL FALL REHABILITATION PROJECT YOSEMITE NATIONAL PARK

INTRODUCTION/PURPOSE OF THIS REPORT

The National Park Service (NPS) proposes to improve visitor facilities and services at the base of Bridalveil Fall in Yosemite Valley, California. The NPS prepared the *Bridalveil Fall Rehabilitation Project Environmental Assessment (Bridalveil Fall EA)* as consistent with the National Environmental Policy Act and coordinated the requirements of National Historic Preservation Act (NHPA) Section 106 with the NEPA process. This report provides a stand-alone analysis of the Bridalveil Fall Rehabilitation project as consistent with the NHPA Section 106 review process. The *Bridalveil Fall EA* evaluates three alternatives for the proposed action: Alternative 1 – No Action Alternative, Alternative 2 – Bridalveil Creek Pedestrian Bridge, and Alternative 3 – Expanded Viewing Platform. This report evaluates the proposed undertaking (Alternative 3, NPS preferred alternative) per NHPA Section 106.

36 CODE OF FEDERAL REGULATIONS § 800.3 INITIATION OF THE SECTION 106 PROCESS (STEP 1 OF STANDARD SECTION 106 REVIEW PROCESS)

Relationship of Undertaking to Merced River Plan

The proposed Bridalveil Fall Rehabilitation Project will implement actions prescribed in the *Merced Wild and Scenic River Comprehensive Management Plan Environmental Impact Statement* and *Record of Decision* (Merced River Plan) (NPS 2014) for the Bridalveil Fall area. Merced River Plan actions include the redesign of the Bridalveil Fall Area to improve the visitor experience, reduce congestion, and improve accessibility within the area. The 2014 Merced River Plan Programmatic Agreement (MRP PA) identifies the project as a "Category 3" project which requires additional identification, evaluation and/or assessment of effect determinations consistent with 36 CFR Part 800 (standard NHPA Section 106 review process). Implementation of Category 3 projects requires notification of the State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP), traditionally-associated American Indian tribes and groups, other consulting parties [e.g. The National Trust for Historic Preservation (NTHP) and the Historic Bridge Foundation (HBF)], and the public, of the opportunity to consult on the project.

Description of the Undertaking

The Bridalveil Fall Rehabilitation Project undertaking is Alternative 3 – Expanded Viewing Platform (preferred alternative) in the *Bridalveil Fall EA*. The undertaking will rehabilitate or repair visitor facilities or services at the base of Bridalveil Fall to reduce crowding and improve overall visitor experience, improve visitor safety and reduce congestion, enhance scenic vistas, protect natural and cultural resources, and correct long-standing maintenance issues. Table F-1 lists the actions in the proposed undertaking (Alternative 3) and Figure F-1 illustrates these actions (see also Figure 2-3 in the *Bridalveil Fall EA*).

Table F-1. Summary of Actions under Alternative 3

Project Components	Alternative 3
Parking Lot	• Reconfigure the parking layout within the existing footprint to increase to add 20-24 parking spaces for a total of about 80 spaces (including four accessible parking spaces). • Regrade/raise the northeast east end of the parking lot to reduce flooding. • Add right-hand and left-hand turn lanes from Wawona Road into the parking lot. • Construct an additional entrance/exit driveway into the parking lot. • Construct a plaza/gathering lot with wayfinding and interpretation at the southeast corner of the parking lot. • Move the trailhead a short distance from the parking lot (to avoid high water) and build short boardwalks to connect the trailhead with plaza to the south and parking lot to the east. • Delineate the historical alignment of the carriage road (Bridalveil Fall Trail) as it continues to the parking lot with stones or other materials to retain a visual connection to the historic alignment. • Add a formal trail from the north side to the south side of the parking lot island. • Add bear boxes and additional animal-proof trash and recycling receptacles or dumpsters.
Vault Toilets at the Parking Lot	• Replace the existing four vault toilets at the parking lot with a new comfort station with flush toilets (14 fixtures). • Install necessary infrastructure for the flush toilets (new sewer, electrical lines, transformer, well pump, control panel, water tank, and sewer lift station). The trenching associated with the potential utility corridor would be approximately 4 feet deep and the manholes would be between 5 and 6 feet deep. Most of the trenched soil is approximately 75 percent or more of fill and the other 25 percent or less would be within native soils. Directional drilling may be used rather than trenching for utility installation. • Connect sewer and electrical lines to the main lines in Northside Drive. This will require about one mile of trenching or directional drilling in Wawona Road/Southside Drive up to Pohono Bridge, where the line will cross as part of the bridge (within the bridge deck).
Southside Drive at Bridalveil Straight	• Designate parking for up to three tour buses and one shuttle bus on the south side of Bridalveil Straight. Restrict bus parking to the south side of the road. • Remove approximately 8 parking spaces along Bridalveil Straight and approximately 10 spaces on the west end of El Capitan El Capitan Meadow on Northside Drive to meet capacity prescriptions of the *Merced River Plan* (MRP FEIS page 6-13) and balance additional parking proposed in the Bridalveil parking lot. • Install slightly angled parking for three tour buses on the south side of road. • Construct a visitor gathering and viewing area on the south side of Southside Drive. Selectively remove about 10 conifers to enhance views of El Capitan. Install benches and interpretive/wayfinding information. • Formalize a trail from the gathering/viewing area to the Bridalveil Fall Trail with an accessibility acceptable hardened surface. • Install one crosswalk in the center of Bridalveil Straight.

Table F-1. Summary of Actions under Alternative 3

Project Components	Alternative 3
Trails, Bridges, and Viewing Lots	• Add a new accessible loop trail from the parking lot to the existing viewing platform. The majority of the trail would be 8- to 10-feet wide, at-grade, and hardened with an accessibility acceptable surface. Portions of the trail would be elevated to reduce impacts to sensitive areas. Trail would be located to avoid archeological and ethnographic sites. • Repair the Bridalveil Fall Trail from the third bridge to the east, where it meets the Valley Loop Trail with an accessibility acceptable hardened surface. • Expand the intersection of the Bridalveil Fall Trail and trail to the existing viewing platform for interpretation and gathering. • Improve the viewing area to the northeast side of Bridge 3, adjacent to the Bridalveil Fall Trail (approximately 760 square feet in size). • Improve and delineate the access to the viewing area at the southwest side of Bridge 3 (760 sq. feet). Improvements would be minor - no blasting, rock removal, or heavy grading. • Rework the existing trail from the Bridalveil Fall Trail to the viewing platform. The trail will be a minimum of 8-feet wide with stairs as needed. Rework the stairs to meet code. • Expand the existing viewing platform from 400 square feet to 1,500 square feet. Install safety railing. • Construct an approximately 700-square foot overlook on the new accessible loop trail 120 linear feet south of the existing platform. • Add wayfinding and interpretive signage throughout the project area. • Remove small conifer trees (<20 inches dbh) from within the dripline of selected mature California black oaks to improve oak habitat (<50 small trees).
Accessibility	• Ensure that all new trails and pathways are accessible. The only trail in the project area that would not be accessible is a portion of the existing trail that leads from the Bridalveil Fall Trail to the viewing platform (the new loop trail would provide an accessible route to the viewing platform).

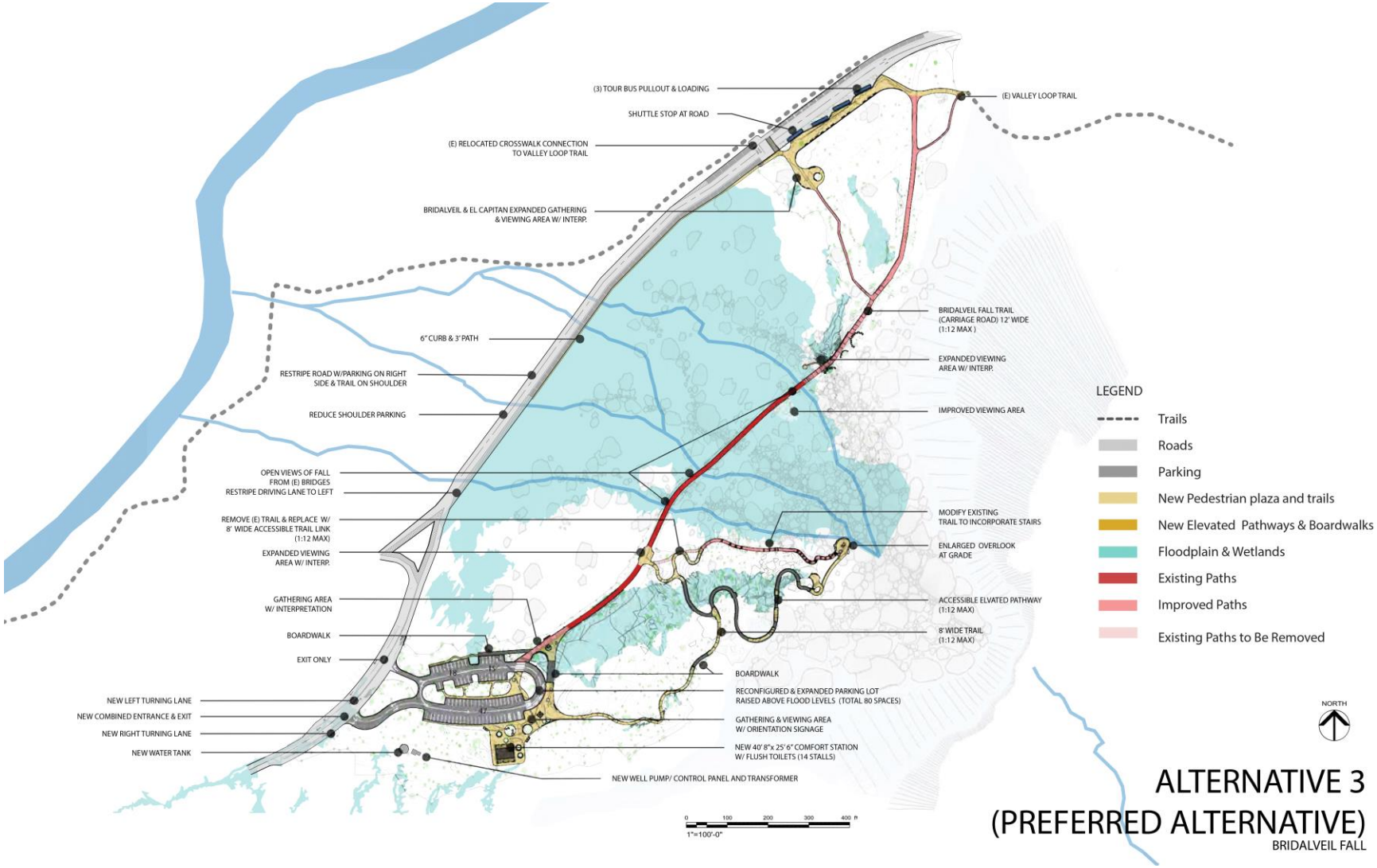

Figure F-1. Alternative 3

Public and Consulting Party Identification and Participation

In accordance with 36 CFR§ 800.8(a)(1), the NPS coordinated the NEPA compliance process with the Section 106 process for the Bridalveil Fall Rehabilitation Project. On April 24–25, 2017, the park invited the SHPO, ACHP, NTHP, and the HBF, to consult on this project per the stipulations of the MRP PA. The NPS provided the SHPO and the ACHP with notification that the park was preparing the Bridalveil Fall EA and intended to coordinate the NEPA and Section 106 compliance processes consistent with 36 Code of Federal Regulations (CFR) Section (§) 800.8(a)(1). The NPS initiated tribal consultation in May 2017. On May 31, 2017, the SHPO sent correspondence acknowledging the initiation of consultation for this project. The ACHP, NTHP, and HBF declined to participate in the consultation specific to this project. Additional information on consultation status with the NHPA Section 106 consulting parties is provided below.

The park conducted a 30-day public scoping period for the Bridalveil Fall Rehabilitation Project from April 26, 2017, through May 26, 2017. The NPS provided information to the public through an electronic newsletter; press releases; media interviews; posting to the NPS Planning, Environment, and Public Comment (PEPC) website; and at a public open house on May 10, 2018. The public scoping report is posted online under the document list at https://parkplanning.nps.gov/bridalveil. A few public comments recommended that the park consult with tribes and agencies responsible for historic properties to address concerns about the cultural sensitivity of the area (e.g., when considering any new construction or realignments of facilities and in considering the visitor experience and contemplation of the area's cultural significance) and that the park monitor for potential impacts to cultural resources. In addition, there was a suggestion to provide a place of quiet reflection to honor the cultural significance of the area.

Traditionally Associated American Indian Tribes and Groups

The Yosemite National Park American Indian Consultation Program facilitates regulatory compliance with statutes, Executive Orders, policies, and guidance related to American Indian resources, issues, and concerns. The NPS consulted with both federally recognized and federally non-recognized American Indian tribes and groups with ancestral connections to Yosemite National Park lands and resources throughout the design and development of the project and environmental analysis.

The park currently maintains consultative relationships with seven American Indian tribes and groups, including five federally recognized American Indian tribes (Bridgeport Indian Colony, Bishop Paiute Tribe, North Fork Rancheria of Mono Indians of California, Picayune Rancheria of the Chukchansi Indians, and the Tuolumne Band of Me-Wuk Indians), and two federally non-recognized American Indian groups (American Indian Council of Mariposa County, Inc. [also known as the Southern Sierra Miwuk Nation] and the Mono Lake Kutzadika[a]). Consultation with federally recognized American Indian tribes takes place on a government-to-government basis.

On May 5, 2017, the park requested tribal participation in the scoping and development of the Bridalveil Fall Rehabilitation Project and formally requested identification of historic properties with religious and cultural significance that might be affected by the project. The park and tribes met to discuss the project on June 8, 2017, and conducted a site visit on August 1, 2017. The NPS considered comments received from traditionally associated American Indian tribes and groups throughout the planning process. The NPS will continue to consult with traditionally associated American Indian tribes and groups throughout project design and implementation to ensure that historic properties with religious and cultural significance are not adversely effected.

Tribal comments received through letters, consultation meetings, site visits, and conference calls include:

- Alternative 2 will have more of an effect on archeological and ethnographic resources than Alternative 3. However, the tribes and groups would prefer a second comfort station (proposed under Alternative 2) to minimize the use of the natural areas as toilets.
- Tribal representatives expressed concerns of the proposed construction of a trail bridge across the creek beneath the fall, which would impact cultural views in an area with spiritual significance. There is already development on the south side of the creek from the existing trail and an existing water pipeline, so tribal representatives are not as concerned about the new proposed loop trail from the parking lot to the existing viewing platform.
- Generally, the tribes have concerns about elevating trails above the ground plane (e.g. attachment of trail structures to boulders) but if a trail has to be elevated to cross a drainage , then the tribes have requested the opportunity to review and comment on any draft design plans. The tribes are not supportive of drilling into the boulders, preferring more traditional construction methods for trails (e.g. retaining walls, use of stone masonry).

California State Historic Preservation Officer (SHPO)

The NPS notified the SHPO of the Bridalveil Fall undertaking by written correspondence dated April 25, 2017, in accordance with 36 CFR § 800.3. This report provides the information needed for the SHPO to assess the effects of the proposed project, consistent with Steps 2 and 3 of the process (36 CFR §§ 800.4 -.5) Through this Section 106 Report, the NPS is seeking review and SHPO concurrence with its finding of no adverse effect associated with the proposed undertaking. The park will summarize how the Section 106 compliance and consultation was concluded in the decision document for the project.

Advisory Council on Historic Preservation (ACHP)

Consistent with guidance established in the MRP PA, the NPS invited the ACHP to consult on the MRP PA regarding the Bridalveil Fall Rehabilitation Project through the ACHP's Electronic Section 106 Documentation Submittal System (*e*106) on April 25, 2017. The ACHP did not request to be a consulting party as a result of the e-notification.

National Trust for Historic Preservation (NTHP)

Chartered by Congress in 1949, the NTHP is now a privately funded nonprofit organization that works to acquire and administer historic places, provide education and outreach, and support direct action to identify and save threatened historic places throughout the United States. Consistent with guidance established in the MRP PA, the NPS notified the NTHP of the Bridalveil Fall Rehabilitation Project by written correspondence dated April 25, 2017. The NTHP did not request to be a consulting party.

Historic Bridge Foundation (HBF)

The HBF is a nonprofit organization that advocates for the preservation of historic bridges in the United States by sharing information, supporting education, and participating in consultation with public officials to devise reasonable alternatives to demolishing or adversely affecting historic bridges. Consistent with guidance established in the MRP PA, the NPS notified the HBF of the Bridalveil Fall Rehabilitation Project by written correspondence dated April 25, 2017. The HBF did not request to be a consulting party.

36 CFR § 800.4 IDENTIFICATION OF HISTORIC PROPERTIES (STEP 2 OF STANDARD SECTION 106 REVIEW PROCESS)

Area of Potential Effects

The area of potential effects (APE) defined for this undertaking is located in the east end of Yosemite Valley and extends from Southside Drive up to Bridalveil Fall along the base of the talus slope. The western boundary for the APE includes approximately 400 feet of Wawona Road and its intersection with Southside Drive. The APE also includes the utility corridor that would extend from the new comfort station to Southside Drive and head west along the road for approximately 6,500 feet, up to and including Pohono Bridge. The vertical APE extends approximately 4 to 6 feet below surface to encompass the trenching associated with the potential utility corridor (approximately 4 feet deep) and the manholes (between 5 and 6 feet deep). To minimize ground disturbance, the NPS will use directional drilling, where possible, in lieu of trenching. In accordance with NHPA Section 106, this APE accounts for potential direct and indirect effects to historic properties.

Historic Properties within the APE

The assessment of effects to historic properties presented in this report includes all historic properties located within the APE that are either listed or eligible for listing in the National Register of Historic Places (NRHP). Table F-2 lists the historic properties in the APE and summarizes their NRHP status and significance, level of significance, period of significance, and contributing resources. A map of select historic properties potentially affected by the undertaking is included as Exhibit 1 of this report. Photos of select individual properties are included as Exhibit 2. Due to their sensitive nature, this public report does not depict the locations of archeological and ethnographic properties.

Built Environment (Historic Structures and Landscapes)

The Historic Resource Study *Yosemite: The Park and Its Resources* (Greene 1987) is the park's primary baseline document for identifying historic buildings, structures, and sites at a park-wide scale. Other major resource studies and documentation efforts provide more detailed, resource-specific data for identifying historic properties in the APE for the Bridalveil Fall Rehabilitation Project. These include historic property nominations, Historic American Engineering Report (HAER) records, determinations of eligibility, and historic structure/cultural landscape inventories. As a result of the efforts associated with these earlier resource studies and documents, a range of historic structures, sites, and landscape characteristics have been identified within the APE. Specifically, several Yosemite Valley Historic District contributing structures and landscape features are within the APE (refer to Table F-2). One of the contributing structures, the Pohono Bridge, is also included in the Yosemite Valley Bridges district nomination.

Table F-2. Identification of Historic Properties within the APE Affected by the Proposed Undertaking (Alternative 3) of the Bridalveil Fall Rehabilitation Project

Historic Property	Property Type	National Register Status	Level of Significance	Significance Summary	Contributing Resources within the APE
Yosemite Valley Historic District	District	Listed 2006	National	The historic development in Yosemite Valley as a whole is nationally significant in the themes of outdoor recreations, tourism, and conservation. Since 1864, Yosemite has been an archetype for the preservation of scenic places through their development as public parks. The district's period of significance is 1855–1942.	Pohono Bridge Bridalveil Fall Access Road Bridalveil Fall Trail Bridalveil Fall Bridges Numbers 1–3 Valley Loop Trail Southside Drive View from pull-off on Southside Drive to Bridalveil Fall and Leaning Tower View from Northside Drive to Bridalveil Fall
Yosemite Valley Bridges	District	Listed 1977	National	These Valley bridges are unique for their architectural design and aesthetic considerations. The use of native granite in the form of rough boulders reflects the tenets of the Rustic style. They represent rare early examples of projects completed under the partnership between the NPS and the Bureau of Public Roads. The district's period of significance is 1922–1933. The bridges also contribute to the Yosemite Valley Historic District.	Pohono Bridge
Yosemite Valley Archeological District	District	Listed 1976	Regional, Local	Contributing sites are significant in their ability to yield important information about prehistoric life ways. Individual sites in the district vary by type, size, depth, complexity, length of occupation, diversity of cultural material, and potential to yield important scientific information. The district has been formally evaluated for eligibility under Criterion D in the National Register of Historic Places. Many of the sites listed in the district have not been formally investigated to establish their physical integrity, age, and materials constituents.	7 prehistoric sites
Archeological Resources	Potentially eligible to archeological district	Not evaluated for NRHP	Unknown	The site was recorded after the 1976 NRHP nomination. This site may yield additional scientific data and/or represent resources of religious or cultural significance. As a resource type, historic-era archeological sites have generally not been evaluated for eligibility.	1 historic site

Archeological Resources

Efforts to identify archeological properties included review of data of previously surveyed areas and known archeological resources within the APE. Sources included, but were not limited to, archeological site records, project reports, and the cultural Geographic Information System database. Based on the records search, multiple archeological fieldwork projects have occurred in the area, but a formal reconnaissance survey had not been performed since the archeological surveys conducted by the California State University, Stanislaus, in 1974 (Napton and Greathouse 1976). In the spring of 2015, Yosemite National Park re-surveyed the area of the APE that extends from Southside Drive up to Bridalveil Fall (Curtis 2015). The NPS surveyed the entire utility corridor extending to Pohono Bridge in 2006 (Gavette 2006). There are eight archeological sites within the APE, seven of which are contributors to the Yosemite Valley Archeological District. These sites were nominated based on their surface components because no formal excavation had occurred. In October 2017, the park conducted an archeological investigation of one site located near the Bridalveil Fall parking lot to verify its boundary, which had been first recorded in 1974 and updated in 2015. One site was recorded after the original nomination form was drafted in 1976 and remains unevaluated for the NRHP.

Historic Properties with Religious and Cultural Significance to Traditionally Associated American Indian Tribes and Groups

Many historic properties within the APE hold religious and cultural significance to traditionally associated American Indian peoples. Through professional ethnographic studies and government-to-government consultation with American Indian tribes, the NPS has identified the presence of historic properties with religious and cultural significance to American Indian tribal groups that, in some cases, are separate and distinct from the Yosemite Valley Archeological District. The NPS is committed to continuing consultation with tribes and groups in regard to this project as design progresses and as the project is implemented.

Throughout the Bridalveil Fall Rehabilitation Project planning process, the NPS has made a concerted effort to identify traditional cultural properties through numerous consultation workshops, site visits, and distribution of working drafts of the plan's components. During these consultation efforts, the park worked with groups and individuals who have special knowledge and interests in the history and culture of the Bridalveil Fall area. Specifically, tribal partners and park staff visited many locations within the APE to discuss actions and the potential impacts to resources or effects to historic properties with or without religious and/or cultural significance.

The NPS has a consultative relationship with traditionally associated American Indian tribes and groups independent of the consultation required on historic properties under the NHPA. The park has numerous cooperative agreements with tribes and groups that articulate the commitments the respective parties have made regarding consultation activities, annual traditional events and ceremonies in the park, and monitoring requirements during archeological investigations and/or construction projects.

36 CFR § 800.5 ASSESSMENT OF ADVERSE EFFECTS (STEP 3 OF STANDARD SECTION 106 REVIEW PROCESS)

Under Section 106 of the NHPA, once historic properties have been identified in an undertaking's APE, and it has been determined that those historic properties may be affected by a proposed undertaking, the agency official shall assess the effects on those resources in accordance with 36 CFR § 800.5, *Assessment of adverse effects*. An adverse effect is found when an "undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's

location, design, setting, materials, workmanship, feeling, or association" [36 CFR § 800.5(a)(1)]. The criteria of adverse effect are applied to all historic properties (listed, eligible, or identified) within the APE, with consideration given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP.

This report presents the initial NPS assessment of effect for the undertaking. The NPS will work with consulting parties to determine if the assessment reflects all relevant or applicable concerns, and whether the park has developed and evaluated modifications to the Bridalveil Fall Rehabilitation Project that could avoid, minimize, or mitigate adverse effects [36 CFR § 800.6(a)].

Criteria of Adverse Effect

Actions that result in an assessment of adverse effects to historic properties include, but are not limited to [36 CFR § 800.5(2)]:

(i.) Physical destruction of or damage to all or part of the property;
(ii.) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;
(iii.) Removal of the property from its historic location;
(iv.) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
(v.) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;
(vi.) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and
(vii.) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

Assessment of Adverse Effects

The proposed undertaking (Alternative 3) would have no adverse effect on either the Yosemite Valley Historic District or the Pohono Bridge as a contributing structure to the Yosemite Valley Bridges historic district. Table F-3 documents the assessment of adverse effects for each of the contributing resources in the built environment within the APE. In summary, Alternative 3 would repair and improve the Bridalveil Fall trail system and parking to address public use in the area by providing safe, accessible paths of travel and viewing areas, improving site orientation, and improving parking efficiency, while avoiding or minimizing effects to the contributing structures of the Yosemite Valley Historic District and Yosemite Valley Bridges that are within the APE. Yosemite's A Sense of Place: Design Guidelines for Yosemite National Park (2011) were used to ensure that the proposed alternatives were compatible with the historic character of the Yosemite Valley Historic District.

The proposed undertaking would result in no adverse effect to archeological sites of the Yosemite Valley Archeological District and all archeological resources and historic properties with religious and cultural significance that are within the APE (Tables F-4 and F-5). Ground disturbance will be outside of the boundaries of sites near the rehabilitation actions. Electrical and sewer lines for the new comfort station would be installed along the existing road alignment of Southside Drive, which bisects two archeological sites. Based on previous disturbance and lack of integrity, one prehistoric site was recommended as a non-contributing element to the Yosemite Valley Archeological District; therefore, there would be no adverse effect to the site. Due to the testing at the second site, it was confirmed that the historic site, composed of three distinct historic deposits located away from the road, lacked subsurface artifacts near the vicinity of the road corridor and that the site had been assessed/visited recently with no surface features or scatters near the road; therefore, there would be no adverse effect to the site or to the Yosemite Valley Archeological District due to utility construction beneath the existing road.

To ensure the avoidance of adverse effect, a park archeologist will flag the boundaries of archeological sites during ground disturbing actions to protect these locations. Archeologists will work with construction crews to prevent staging of materials and driving of machinery within the boundaries of archeological sites. In addition, work crews will be briefed about the nature of cultural resources within the project area. Archeological monitoring would occur during construction activities nearby the boundaries of archeological sites. Should unanticipated artifacts be uncovered during the project work when an archeologist is not present, park archeologists will respond to the discoveries.

Alternatives Considered but Dismissed and Avoidance Measures

The NPS considered a range of actions when developing the alternatives for the rehabilitation of the Bridalveil Fall area. The planning team analyzed, considered, and dismissed several actions because they did not fully satisfy the objectives of this planning effort including the avoidance of adverse effects to historic properties.

Two alternatives analyzed but not selected include a No Action Alternative (Alternative 1) and Alternative 2.

Under the No Action Alternative, the park would not rehabilitate or repair visitor facilities at Bridalveil Fall with the exception of emergency repairs and routine and periodic maintenance activities. There would be no improvements to visitor experience, scenic vistas, visitor safety, or congestion; the park would not meet accessibility standards; and the park would not correct long-standing maintenance issues. Maintenance and repair needs would likely increase with continued visitation and aging infrastructure.

Alternative 2 includes construction of a new bridge across Bridalveil Creek from the existing viewing platform to a new trail on the east side of Bridalveil Creek. The entire bridge would serve as a viewing area with accessible and enlarged overlooks. The east side of the new bridge would connect to a new four-foot-wide trail that leads to the Bridalveil Fall Trail adjacent to Bridge 3.

Alternative 2 also includes construction of a second comfort station at Bridalveil Straight. There would be a second gathering and viewing area added near the new comfort station. A new combined entrance and exit road to the parking lot would replace the existing entrance/exit road approximately 150 feet south of the existing entrance/exit.

Under Alternative 2, the connection between the existing Bridalveil Fall Trail and the parking lot would be widened and raised with fill material to avoid areas that flood during high water periods. A different paving material would be used to delineate the historic alignment of the Bridalveil Fall Trail to the parking lot.

Table F-6 lists additional actions considered but dismissed.

Table F-3. Assessment of Adverse Effects of the Proposed Undertaking (Alternative 3) of the Bridalveil Fall Rehabilitation Project on the Built Environment

Historic Resource Potentially Affected	Historic Property to Which the Resource Contributes	Potential Effects from Alternative 3	Assessment of Effects
Pohono Bridge	Yosemite Valley Historic District; Yosemite Valley Bridges	Encase the electrical and sewer lines for the new comfort station within the bridge deck.	No adverse effect because the utility lines would be encased within the aggregate and asphalt deck so as not to damage or alter the concrete arch structure or other significant character-defining features of the bridge during construction, and yet still conceal the utility lines after construction is completed.
Bridalveil Fall Access Road	Yosemite Valley Historic District	Restripe the access road to change it to an exit-only lane with the addition of a new entrance to the parking area.	No adverse effect as the historic alignment of the access road would be maintained.
Bridalveil Fall Trail (Historic Carriage Road)	Yosemite Valley Historic District	Add a new trailhead and move the existing trailhead a short distance and raise it on fill up to 18 inches higher to minimize ponding during high water events; install a new culvert to direct water under the trail. Harden the entire trail (from the Bridalveil Fall parking lot to Bridalveil Straight) with an accessibility acceptable surface to 12 feet in width consistent with existing conditions. Add a new paved viewing area with interpretative signs at the intersection with the trail leading up to the viewing platform.	No adverse effect because the structural features of the historic carriage road would be retained and the NPS will implement the following design and construction specifications to preserve the overall character of the trail: delineate the historic carriage road alignment within the trailhead from the parking lot with stones or a similar material; and apply a chip-seal surfacing using gravel that is compatible in color with the surrounding soil to provide a more rustic appearance.
Bridalveil Fall Bridge Number 1	Yosemite Valley Historic District	Harden Bridalveil Fall Trail with an accessibility acceptable surface to 12 feet in width consistent with existing conditions.	No adverse effect as the reinforced concrete arch spans, stone spandrel and wing walls, or other character-defining features of the bridge would not be altered.
Bridalveil Fall Bridge Number 2	Yosemite Valley Historic District	Harden Bridalveil Fall Trail with an accessibility acceptable surface to 12 feet in width consistent with existing conditions.	No adverse effect as the reinforced concrete arch spans, stone spandrel and wing walls, or other character-defining features of the bridge would not be altered.

Table F-3. Assessment of Adverse Effects of the Proposed Undertaking (Alternative 3) of the Bridalveil Fall Rehabilitation Project on the Built Environment

Historic Resource Potentially Affected	Historic Property to Which the Resource Contributes	Potential Effects from Alternative 3	Assessment of Effects
Bridalveil Fall Bridge Number 3	Yosemite Valley Historic District	Remove the stone steps at the east approach to the bridge. Grade the approach to meet ABA standards for accessibility and provide the required level of accessibility in accordance with park policy. Harden the trail with an accessibility acceptable surface to 12 feet in width consistent with existing conditions.	No adverse effect because the stone steps are non-historic elements and hardening the approach would not diminish the integrity of historic materials or character-defining features of the bridge. Although meeting ABA standards would affect the vertical alignment of the historic carriage road, the effect would be minimal and would not alter the overall character of the road in this area.
Valley Loop Trail	Yosemite Valley Historic District	Relocate the existing crosswalk in the center of Bridalveil Strait to the Valley Loop Trail.	No adverse effect as the appearance of the Valley Loop Trail would be maintained and no character-defining features of the trail would be altered.
Southside Drive	Yosemite Valley Historic District	Relocate the existing crosswalk to the Valley Loop Trail. Widen an approximately 600-foot-long section of Southside Drive to add a tour bus pullout and loading area and a seasonal shuttle stop.	No adverse effect as Southside Drive would continue to hold the route, appearance, and compatibility with the landscape and no associated significant historic features of the road within the Valley would be altered.
View from pull-off on Southside Drive to Bridalveil Fall and Leaning Tower	Yosemite Valley Historic District	Remove selective trees and vegetation.	No adverse effect as selective removal of trees (no black oaks) and vegetation would restore historic vistas to Bridalveil Fall.
View from Northside Drive to Bridalveil Fall	Yosemite Valley Historic District	Remove selective trees and vegetation.	No adverse effect as selective removal of trees (no black oaks) and vegetation would restore historic vistas to Bridalveil Fall.

Table F-4. Assessment of Adverse Effects of the Proposed Undertaking (Alternative 3) of the Bridalveil Fall Rehabilitation Project on Archeological Resources

Historic Resource Potentially Affected	Historic Property to Which the Resource Contributes	Potential Effects from Alternative 3	Assessment of Effects
Six archeological sites (prehistoric)	Contributing to the Yosemite Valley Archeological District	All proposed work from Southside Drive at the intersection of Wawona Road and extending up to Bridalveil Fall along the base of the talus slope.	No adverse effect to the six archeological sites. The sites have been avoided through design of facilities away from the sites
One archeological site (prehistoric)	Site was originally listed as contributing to the Yosemite Valley Archeological District. Later re-evaluated and recommended as non-contributing (Nilsson et al. 2009)	Installation of utility corridor from new restroom to Pohono Bridge.	No adverse effect. Site was tested in 2006 and no subsurface deposits were located adjacent to the proposed utility corridor within Southside Drive.
One archeological site (historic)	Site was recorded after the 1979 NRHP Yosemite Valley Archeological District nomination and remains unevaluated for the NRHP	Installation of utility corridor from new restroom to Pohono Bridge.	No adverse effect. Testing of adjacent prehistoric site 2006 extended into this site. No subsurface deposits located within utility corridor along Southside Drive.

Table F-5. Assessment of Adverse Effects of the Proposed Undertaking (Alternative 3) of the Bridalveil Fall Rehabilitation Project to Historic Properties with Religious and Cultural Significance

Historic Resource Potentially Affected	Historic Property To Which the Resource Contributes	Potential Effects from Alternative 3	Assessment of Effects
Three locations of ethnographic/religious and cultural significance	Yosemite Ethnographic Database and consultation with tribal members	Entire project development.	No adverse effect. Consultation with traditionally associated tribes and groups indicates that resource areas with religious and cultural significance will not be affected by project.

Table F-6. Actions Considered but Dismissed

Action	Reasons for Dismissal
Allow buses to unload passengers at the parking lot and pick up passengers at Bridalveil Straight.	There would be no guarantee that bus parking would be available at Bridalveil Straight for passenger pick-up. Buses waiting for parking could create additional congestion and confusion along Bridalveil Straight.
Add vault toilets at Bridalveil Straight.	Vault toilets require consistent pumping and regular cleaning. Park staff must have specialized training to operate pumping equipment. The park does not have the operational capacity to add another vault toilet considering the intensive maintenance required to maintain vault toilets. The park considered the addition of flush toilets at Bridalveil Straight, but not vault toilets, under Alternative 2 of the EA.
Construct a leach field in the historic sewer plant location north of Bridalveil Fall, adjacent to the Merced River near its confluence with Bridalveil Creek. This new leach field could serve the new flush toilet at the parking lot and remove the need to construct lengthy sewer and power lines to connect to the existing system.	This option is inconsistent with the 2014 *Merced River Plan*, which calls for removal of the remains of the abandoned plant and restoration to natural conditions. The park abandoned and demolished the historic sewer plant in 1975 when the park constructed a new tertiary sewage treatment plant in El Portal. The park must protect and enhance the water quality of the Wild and Scenic Merced River, and a new leach field in proximity to the river would be a risky endeavor in terms of protecting water quality. Construction of a new leach field in this area would likely require the park to amend the *Merced River Plan*. It is uncertain whether the park could obtain permits under the Clean Water Act to construct a leach field in close proximity to the Merced River. A new leach field would require the park to connect to a power source and construct additional infrastructure.
Construct a new trail and viewing platform from the Bridalveil Fall Trail near Bridge #3 toward the base of Bridalveil Fall.	Trail would be constructed within the bed-and-banks of Bridalveil Creek stream system. It would be subjected to high water velocities and high water depths during peak flows, creating the need for additional repair, maintenance, and debris clearing. The trail would be constructed into a relatively pristine area, with associated impacts to the natural habitat. The existing viewing platform would be visible from the new platform and hikers may hike cross-country from one to the other, creating new social trails in a relatively pristine area.
Remove the ability to make left hand turns out of the parking lot to decrease congestion.	If vehicles want to make a left turn, they would need to travel to Southside Drive and then make the one-way loop across El Capitan Crossover to Northside Drive and then back across Pohono Bridge. This is a considerable distance, it could take considerable time during congested periods of visitation, and the action could promote illegal U-turns on Wawona Road.
Move all parking to the right side of Bridalveil Straight and enhance views of El Capitan from the south side of the road. This would encourage visitors to stay on the south side of the road and improve safety in the area.	The vast majority of visitors stop along Bridalveil Straight for the breathtaking views of El Capitan (on the left side of the road). Visitors also stop for a number of other reasons including stretching their legs, checking maps, picnic lunches, river access. Keeping parking on the right side of the road may encourage some users to stay on the right side and not cross the street, but a substantial amount of visitors would be expected to cross the street.

Cumulative Effects

In general, past development, operation, and maintenance of facilities throughout Yosemite National Park have protected and preserved the integrity of historic resources affected by this project. The cumulative impact analysis focuses on those historic resources affected by this project including the Bridalveil Fall access road, Bridalveil Fall trail (carriage road), and the three carriage road bridges in conjunction with past present and future projects. Other affected historic resources include Southside Drive, Pohono Bridge, and the historic views of the fall from the Valley View pullout and Southside Drive in the vicinity of the fall. For the purpose of cumulative affects analysis, the NPS has identified past projects that may have affected these historic resources since completion of the Yosemite Valley Historic District National Register nomination, which established the historic status of these resources in 2006. For the Pohono Bridge, historic structure status was established in the Yosemite Valley Bridges National Register nomination (1977). Effects to the trail and carriage road bridges since 2006 have been limited to standard trail/bridge maintenance, which is completed on an as-needed basis to address the high visitor use of the area and any damage from winter storm events. No changes to the historic carriage road alignment or its associated features have been made since completion of the nomination in 2006. Previous work along Southside Drive has not affected the historic alignment of the road and has typically focused on addressing parking issues in the immediate vicinity of the fall and for the El Capitan viewing area. Likewise, the Pohono Bridge, a contributing structure to both the Yosemite Valley Historic District (2006) and the Yosemite Valley Bridges (1977) National Register nominations, has received regular maintenance including minor damage repairs following the 1997 flood. Continued tree growth in the historic viewing areas along Southside Drive and the Valley View pullout is addressed through implementation of scenic vista management prescribed in the Merced River Plan (2014).

Current and reasonably foreseeable actions have been, and will continue to be, carried out in accordance with the park's design guidelines (2011) and the Secretary of the Interior's Standards for the Treatment of Historic Properties. Implementation of a program of scenic vista management in accordance with the Merced River Plan (2014) will result in the protection and restoration of historic vistas and important viewing areas in the Yosemite Valley.

Similarly, past development, operation and maintenance of facilities throughout the Yosemite Valley Archeological district have, for the most part, protected and preserved the integrity of historic properties having an archeological component. All sensitive archeological areas and sites have been avoided in the planning of this project, hence the project does not adversely add to cumulative effects for this class of historic property.

Summary

The NPS has concluded that the Bridalveil Fall Rehabilitation undertaking would have no adverse effect on historic properties. The proposed undertaking (Alternative 3) would not alter, directly or indirectly, any of the qualifying characteristics of the contributing historic, cultural, or archeological resources in the APE in a manner that would diminish their integrity of location, design, setting, materials, workmanship, feeling, or association either individually or of the historic and archeological districts as a whole.

The park continues to consult with the participating 106 consulting parties and will seek SHPO concurrence on no adverse effect to historic properties prior to signing the decision document for the project. The park will continue to provide further design drawings to the traditionally associated American Indian tribes and groups for review and comment to continue to avoid effects to historic properties with religious and cultural significance.

36 CFR § 800.8: COORDINATION WITH THE NATIONAL ENVIRONMENTAL POLICY ACT

Consistent with 36 CFR § 800.3(b) and 36 CFR § 800.8, the review process for Section 106 of the NHPA has been coordinated with, but independent of the NEPA planning process.

A public meeting and webinar will be held during the 30-day public comment period for the EA, disclosing the assessment of effects for historic properties in which their locations or character are not confidential. The public will be encouraged to express their views on potential effects of the Bridalveil Fall Rehabilitation Project on historic properties through their written comments.

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NPS
2011 A Sense of Place: Design Guidelines for Yosemite National Park.

2014 Merced Wild and Scenic River Final Comprehensive Management Plan and Environmental Impact Statement. February.

2014 Programmatic Agreement among the National Park Service at Yosemite National Park, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Compliance with Section 106 of the National Historic Preservation Act for the Merced Wild and Scenic River Comprehensive Management Plan (Merced River Plan).

National Register nomination forms for Yosemite's historic properties are found at:

https://www.nps.gov/yose/learn/historyculture/nr-yose-list.htm

EXHIBIT 1: MAP OF BRIDALVEIL FALL REHABILITATION PROJECT AREA OF POTENTIAL EFFECTS

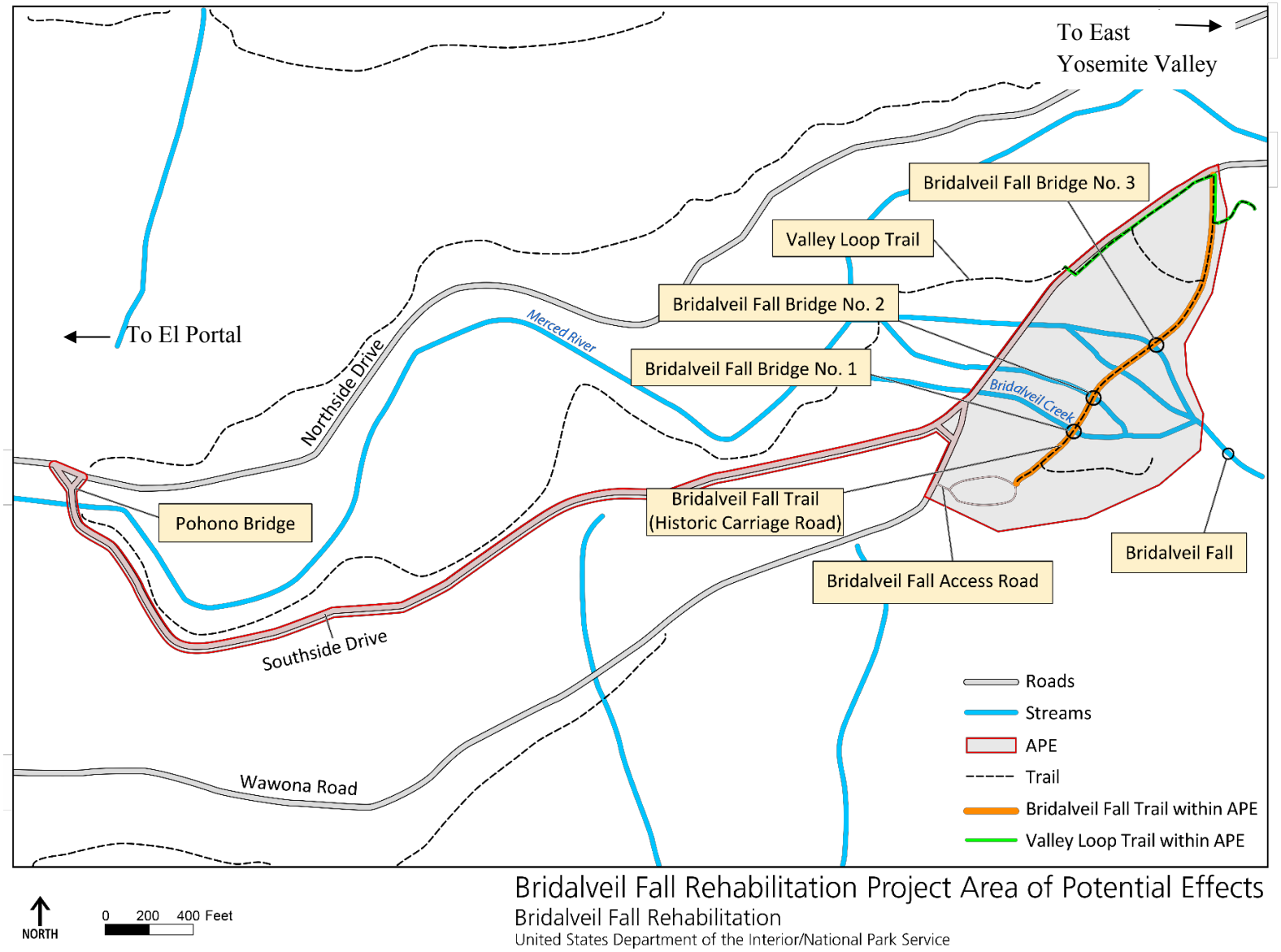

EXHIBIT 2: PHOTOS OF SELECT HISTORIC PROPERTIES IN THE BRIDALVEIL FALL REHABILITATION PROJECT AREA OF POTENTIAL EFFECTS

Photo F-1. Pohono Bridge: Contributing Structure in the Yosemite Valley Historic District and Yosemite Valley Bridges.

Photo F-2. Bridalveil Fall Access Road (foreground): Contributing Structure in the Yosemite Valley Historic District. View looking east-southeast towards parking lot.

Photo F-3. Bridalveil Fall Trail: Contributing Structure in the Yosemite Valley Historic District. Trailhead at parking lot (looking northeast).

Photo F-4. Bridalveil Fall Trail: Contributing Structure in the Yosemite Valley Historic District. View looking southwest toward connection with parking lot.

Photo F-5. Bridalveil Fall Bridge #1: Contributing Structure to the Yosemite Valley Historic District (looking north).

Photo F-6. Bridalveil Fall Bridge #2: Contributing Structure to the Yosemite Valley Historic District. View from Bridalveil Fall Trail (looking northeast).

Photo F-7. Bridalveil Fall Bridge #2: Contributing Structure to Yosemite Valley Historic District. View looking southwest from streambank.

Photo F-8. Bridalveil Fall Bridge #3: Contributing Structure in the Yosemite Valley Historic District. View looking south from streambank

Photo F-9. Southside Drive (Bridalveil Straight): Contributing Structure in the Yosemite Valley Historic District. View looking southwest.

Photo F-10. Southside Drive (Bridalveil Straight): Contributing Structure and Historic View within the Yosemite Valley Historic District. View looking northeast.

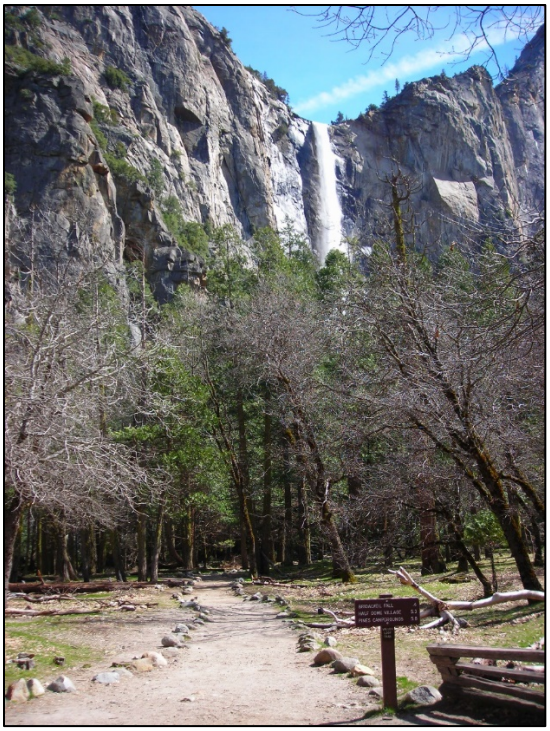

Photo F-11. View from Southside Drive pull-off towards Bridalveil Fall, Yosemite Valley Historic District.

Photo F-12. Historic View from Northside Drive to Bridalveil Fall and Leaning Tower, Yosemite Valley Historic District.
(*Photo by Steven Bumgardner*)

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National Park Service
U.S. Department of the Interior

Bridalveil Fall Rehabilitation
Environmental Assessment
Yosemite National Park
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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.