

Soundscapes

Affected Environment

Regulatory Framework

2006 National Park Service Management Policies

Soundscape Management (Policy 4.9). The National Park Service (NPS) will preserve, to the greatest extent possible, the natural soundscapes of parks. The NPS will restore to the natural condition wherever possible those park soundscapes that have become degraded by unnatural sounds (i.e., noise), and will protect natural soundscapes from unacceptable impacts. Using appropriate management planning, superintendents will identify what levels and types of unnatural sound constitute acceptable impacts on park natural soundscapes. The NPS will take action to prevent or minimize all noise that through frequency, magnitude, or duration adversely affects the natural soundscape or other park resources or values, or that exceeds levels that have been identified through monitoring as being acceptable to or appropriate for visitor uses at the sites being monitored.

Cultural Soundscapes Management (Policy 3.3.1.7). The NPS will preserve soundscape resources and values of the parks to the greatest extent possible to protect opportunities for appropriate transmission of cultural and historic sounds that are fundamental components of the purposes and values for which the parks were established. An example of appropriate cultural and historic sound includes native drumming at Yosemite National Park. The NPS will prevent inappropriate or excessive types and levels of noise from unacceptably affecting the ability of the soundscape to transmit the cultural and historic resource sounds associated with park purposes.

Director's Order #47: Soundscape Preservation and Noise Management

Director's Order #47 outlines the operational policies guiding the protection, maintenance, and restoration of the natural soundscape resource in the national park system. The directive instructs park managers to maintain natural soundscapes that are not affected by external (i.e., human-made) noise. By definition, noise is human-caused sound that is considered unpleasant and unwanted. Where the soundscape is found to be degraded, park managers are to facilitate and promote progress toward the restoration of the natural soundscape (NPS 2000b). There are 11 such instructions and requirements outlined in Director's Order #47.

National Park Service Reference Manual 47

National Park Service Reference Manual 47, *Soundscape Preservation and Noise Management*, prepared in response to Director's Order #47, provides the following: (1) technical guidance on soundscape management planning, including direction on the preparation of soundscape preservation and noise management plans (referred to as soundscape management plans); (2) direction on the measurement of sound characteristics to be applied in soundscape management planning; (3) technical guidance on education opportunities; (4) technical guidance on noise prevention and mitigation; and (5) direction on interagency planning.

Yosemite General Management Plan

The *Yosemite General Management Plan* outlines general management priorities for resource management in the park. With regard to sound, this management plan calls for the limitation of noise to the greatest extent possible. More specifically, it places high priority on reducing traffic congestion in Yosemite Valley to reduce the exposure of visitors to noise associated with motor vehicles. Among the tools available to the park for achieving this reduction in vehicle noise, specifically motorcycle noise, is regulatory enforcement.

Soundscape and Noise

Soundscape is a term used by the NPS to describe the ambient noise setting for a given parkland area. In a park setting, a natural soundscape is an area characterized by various sound sources at detectable sound levels that typically occur without the intrusion of sounds caused by humans or human technology. Park natural soundscape resources encompass all the natural sounds that occur in parks, including the physical capacity for transmitting those natural sounds and the interrelationships among park natural sounds of different frequencies and volumes. Natural sounds occur within and beyond the range of sounds that humans can perceive, and they can be transmitted through air, water, or solid materials.

Noise is often defined as human-caused sound, and is considered to be unpleasant and unwanted. Whether a sound is considered unpleasant depends on the individual listening to the sound and what the individual is doing when the sound is heard (i.e., working, playing, resting, sleeping). While performing certain tasks, people expect and, as such, accept certain sounds. For instance, if a person works in an office, sounds from printers and copiers are generally acceptable and not considered unpleasant or unwanted. By comparison, when people are resting or relaxing, these same sounds are not desired. The desired sounds during these times are referred to as *natural quiet*, a term used to describe ambient (outdoor) natural sounds without intrusion of human-caused sounds. Natural quiet can be essential for some individuals to achieve a feeling of peace and solitude.

Existing Sources of Noise in the Merced River Corridor

Natural sounds in Yosemite National Park and adjacent to the Merced River include waterfalls, flowing water, animals, rustling tree leaves, and many other sounds. These are not considered noise. Typical sources of noise in the park and project area include motor vehicles, human activity and aircraft. Noise does not have to be loud to have an impact on the natural environment.

Motor Vehicles and Human Activity

Corridorwide, motor vehicle noise is generated by visitor, NPS, and concessioner vehicles along roadways. Motor vehicle noise is associated with areas of concentrated visitor and administrative use, including all park roads and parking areas, Yosemite Village, all campgrounds, Yosemite Lodge, and NPS and concessioner stables. Noise from motor vehicles is loudest immediately adjacent to roads and parking areas, but due to generally low levels of natural sound in the background, vehicle noise may be audible a long distance from roads. Other noises associated with human activities in the Merced River

corridor include human voices, stock, park maintenance operations (e.g., construction and maintenance equipment, generators), and recreational activities (e.g., lodging, camping, housing).

Atmospheric conditions (e.g., wind, temperature, humidity, rain, snow) and topography can significantly affect the presence or absence of noise in the Merced River corridor. Additionally, dense vegetation may also produce significant sound attenuation over distance. In general, noise would be expected to be louder in areas where human activities are concentrated and where sound reverberates between natural features, such as canyon walls. The frequency, volume, and source of these noises vary dramatically by season, with the highest levels of noise expected during the summer when visitor use is at its peak.

Noise can affect an animal's physiology and behavior, and if it becomes a chronic stress, noise can be injurious to an animal's energy budget, reproductive success, and long-term survival (Radle 1998; Stone 2000; Brumm 2004). Road noise specifically has been implicated in the disturbance of several bird species, resulting in decreased densities of breeding pairs in the vicinity of roads (Krause 2001).

During one 2006 study, 24% of respondents reported hearing vehicle sounds. These noises were rated as slightly annoying and slightly unacceptable. Consequently, the authors of the study recommended that these sounds be considered second priority for management behind aircraft sounds (Newman et al. 2006).

Aircraft

As part of an aircraft overflight report to Congress in 1994, the NPS conducted a visitor use survey to determine the effects of aircraft noise on the visitor experience. Of the visitors surveyed, 55% reported hearing aircraft sometime during their visit. The report notes that recognition of noise from aircraft was highly variable from location to location and that impacts were greater when visitors removed themselves from automotive transportation and areas where other visitors were present. In Yosemite, a majority of the complaints came from wilderness trail users (BRW 1994).

Measurements made in 1993 at four locations in the park (Rafferty Creek, Soda Springs, Mirror Lake, and Glacier Point) indicated that aircraft were audible 30% to 60% of the time (NPS 1994b). Similar results were found in 2006 when 51% of visitors reported hearing aircraft noise. Because aircraft noise was also considered to be "annoying and unacceptable," the authors of this study recommended that addressing aircraft sounds should be considered a first priority for NPS management consideration (Newman et al. 2006).

Background Sound and Noise Levels

Sound is mechanical energy transmitted by pressure waves through a medium such as air. As previously mentioned, noise is defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. Sound pressure level is measured in decibels (dB), a logarithmic loudness scale with zero dB corresponding roughly to the

threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. Because sound pressure can vary by over one trillion times within the range of human hearing, the logarithmic loudness scale is used to calculate and manage sound intensity numbers conveniently.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that deemphasizes the frequencies below 1,000 hertz (Hz) and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements. All sound/noise levels presented in this document are A-weighted.

Given the variation of community noise level from instant to instant, community noise levels must be measured over an extended period of time to characterize a community noise environment and evaluate cumulative noise impacts. This time varying characteristic of environmental noise is described using statistical noise descriptors. For example, the descriptor L_{eq} is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The data presented in this section represent the L_{eq} sound levels in the Merced River corridor.

Sound-level measurements were obtained for the original *Merced River Plan/EIS* at various locations adjacent to the Merced River (from the headwaters of the Merced River to the base of Vernal Fall), in Yosemite Valley, and in the Wawona area. Additional measurements were collected at Yosemite Village in 2006 for the *Yosemite National Park Acoustic Monitoring Report 2005 & 2006*. Measurements for the original *Merced River Plan/EIS* were obtained with a Larson Davis dosimeter (Model 700). The dosimeter was calibrated with a Larson Davis sound-level calibrator. Measurements for the *Yosemite National Park Acoustic Monitoring Report* were obtained using a Brüel & Kjær sound analyzer equipped with a GRAS Type 40AQ microphone. The measurement system was calibrated immediately before measurements were taken.

Observers in both cases noted the sources contributing to the background level and noted any sources that caused intrusive levels above the typical background sound level. Appendix F includes a table that describes the measurement locations, the measurement results, and the associated sources. Appendix F also includes a figure that shows where the measurements were taken. The results of these measurement efforts are described below, in the context of the Merced River segments from which they were obtained.

Segment 1: Merced River Above Nevada Fall — Sound/Noise Levels

Sound levels at the highest elevations of the Merced River corridor (between the Merced and Triple Peak Forks) measured 35 dB. Also in the headwaters area, approximately 2 to 2.5 miles southeast of Washburn Lake, sound levels ranged from 39 to 41 dB, with the influence of aircraft noise (the maximum observed levels with the aircraft were 43 and 56 dB). At and near Washburn Lake, sound levels ranged from 31 to 36 dB, with very little influence of sound from the river.

At a lower elevation, between Soda Springs and Washburn Lake, sound levels on the trail ranged from 35 to 42 dB. In the Bunnell Cascades and Soda Springs areas, sound levels ranged from 54 to 56 dB. These sound levels primarily resulted from Merced River water washing over granite cascades in both areas. Away from the river, in the Little Yosemite Valley Campground area, sound levels measured 40 dB (in an area with no human activity). At the viewing area overlooking Nevada Fall, sound levels measured 61 dB, with little falls and visitor-related noise accounting for the audible sound.

Segment 2: Yosemite Valley — Sound/Noise Levels

Measurements from the viewing area atop Vernal Falls and on the Mist Trail adjacent to the falls ranged from 66 to 76 dB. In Yosemite Valley, sound levels ranged from 44 to 47 dB along the Lower Yosemite Fall Trail, with maximum observed levels of 66 dB when people passed the monitor on the trail. Notably, there was no water in Yosemite Creek when the monitoring was performed. At Swinging Bridge, sound levels measured 50 dB, with noise from people constituting the greatest source of sound in the area. At Sentinel Bridge, sound levels measured 59 dB. This area experiences noise from vehicle traffic, but speeds are generally slow. Overall, the greatest source of sound was the numerous buses traversing the bridge. Near Happy Isles, sound levels measured 59 dB, with most of the sound resulting from people on the trails and using facilities nearby. In the camping area (Upper Pines Campground), sound levels varied from 32 dB when human activity levels were at the lowest (early in the morning) to 55 dB when activity levels increased during the day. Measurements taken near Yosemite Village reached 52 dB in early afternoon.

West of the Valley Visitor Center area, the river was calm in El Capitan Meadow and no people were present during the monitoring. Measured sound levels in this area were 39 dB. At Devils Elbow, water was flowing through the Merced River, but the sound of the river was minimal due to the lack of rocks and rapids. Sound levels in this area were 44 dB, with a maximum observed level of 67 dB when a bus passed on nearby Northside Drive. In the Cascades area, measured sound levels were 49 dB, with a recorded maximum level of 63 dB when a bus passed on Northside Drive.

Segment 3: Merced River Gorge — Sound/Noise Levels

On El Portal Road, at the stone bridge between Arch Rock and Big Oak Flat, sound levels measured 52 dB. Rushing water sounds accounted for the majority of the background levels. Measurements were taken in an area with no people. Some vehicle noise was audible from El Portal Road, but it was relatively minor due to distance and elevation (the river is approximately 40 feet below the grade of the roadway in this area).

Segment 7: Wawona — Sound/Noise Levels

In Wawona, sound levels were measured in the middle of the old Wawona Bridge on Wawona Road, and west of the covered bridge near the Pioneer Yosemite History Center. Sound levels in these areas were 50 dB and 44 dB, respectively, with maximum observed levels of 59 dB near the covered bridge. The river accounted for some background noise in this area, with vehicle traffic accounting for maximum noise levels.

Environmental Consequences Methodology

Proposed management actions for each alternative were evaluated in terms of the context, intensity, and duration of the impacts on soundscape, and whether the impacts would be considered beneficial or adverse to the soundscape environment. The methodology for evaluating impacts on soundscapes was adapted from those provided by the NPS Natural Sounds Program Office (NPS 2007e). The soundscapes impact assessment involves the identification and qualitative description of the types of actions proposed under each alternative that could affect the ambient acoustic environment. For most sound sources, such characteristics would include the location and movement of the source, its operational features that produce sound, and how the sound would be distributed over time. Impacts are described as potential changes in the existing soundscape resulting from the proposed actions, as compared with existing conditions. The analysis of effects to soundscapes is qualitative, with professional judgment applied to reach reasonable conclusions as to the context, intensity, and duration of potential impacts. The effects of these actions are considered for sensitive human receivers only. Sensitive receivers include nearby residents and recreational users (both day-use and overnight users).

- **Context.** The context of the impact considers whether the impact would be local or regional. Impacts to soundscapes were determined to be local and limited to the Merced River corridor and immediate vicinity. For this reason, context will not be further discussed for soundscapes, except to the extent of describing which segments would be affected.
- **Intensity.** The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts are those in which the effects would not be detectable, having no discernible effect on the ambient environment. Minor impacts would be those that are slightly detectable but would not be expected to have an overall effect on the soundscape environment. Moderate impacts would be clearly detectable and could have an appreciable effect. Major impacts would have a substantial, highly noticeable influence on the ambient noise environment.
- **Duration.** The duration of the impact considers whether the impact would occur in the short-term or the long-term. A short-term impact would be temporary in duration or transitory in effect, such as construction noise. A long-term impact would have a permanent effect on the ambient noise environment.
- **Type of Impact.** Impacts are evaluated in terms of whether they would be beneficial or adverse to the ambient soundscape environment. Beneficial impacts would reduce noise levels, while adverse impacts would have the opposite effect.

Environmental Consequences of Alternative 1 (No Action)

All River Segments

Alternative 1 (No Action) assumes the continuance of existing plans and policies, including the NPS *Management Policies 2006*, Director's Order #47, and the *Yosemite General Management Plan*, among other documents that guide management decisions and soundscapes in the Merced River corridor. Under Alternative 1, the soundscape among Segments 1–8 would remain dominated by natural sources

of sound (e.g., water, wind, birdsong and chatter). Noise levels would continue to be higher where visitor use is intense, such as campgrounds, roads, parking lots, and major trail routes and destinations.

Alternative 1 does not propose measures that would cause an increase in park visitation. However, park visitation is expected to increase at a rate of 3% per year over the next five years. As described in the “Transportation” section of this chapter, congestion around certain park entry points, busy intersections, and parking areas would continue during peak summer days, and associated noise impacts in these areas would persist. The park would continue to utilize discretionary authorities to limit park access during unusually busy days; however, no new formal systems or methods for controlling access would be implemented.

Overnight facilities, both lodging and camping, would remain at current levels, both in number and type of accommodation. This would limit potential increases in nighttime visitation and associated noise. Visitation could, however, shift to other “non-peak” periods of the year (e.g., fall and winter months, spring and fall weekends, summer weekdays). Such a shift would contribute to an increase in visitor-related noise during such periods. Maintenance and administrative activities (i.e., groundskeeping equipment, generators, HVAC, refrigeration, helicopter use in support of park operations) would also remain similar to those under present conditions. However, with increased visitation, such activities may be required more frequently, thereby causing an indirect increase in park noise. High-altitude aircraft overflights, an issue that is national in scope, would continue to affect soundscapes in the park. Aircraft noise is highly variable from location to location and impacts are greater when visitors are in areas removed from other vehicle traffic and visitor noise. Impact determinations are discussed for specific segments and summarized below.

Segment 1: Merced River above Nevada Fall

Noise levels in the area of Segment 1 would remain similar to current conditions. Under Alternative 1 (No Action), soundscapes in wilderness segments would continue to remain dominated by natural sources of sound, punctuated by noises from aircraft and the occasional human voice or sound made by pack stock. Use of visitor facilities would continue to increase with visitation. Some impacts on natural soundscapes would be expected in areas of easily accessible wilderness (e.g., the trail to Half Dome) and campgrounds (e.g., Little Yosemite Valley, Merced Lake Backpackers Camp, Merced Lake High Sierra Camp, Nevada Fall Overlook). It is anticipated that annual daytime use of these areas would increase with the projected increase in visitor demand, thereby raising the level of human-related sounds (e.g., talking and hiking). A rise in human-related sounds would contribute to a long-term, negligible to minor, adverse impact on the soundscape environment by diminishing the natural quiet and sounds of nature that help make up the wilderness character that is valued in the park.

Segment 1 Impact Summary: A gradual increase in park visitation, and associated human-caused noise, would contribute to a long-term, negligible to minor, adverse impact on the soundscape environment.

Segment 2: Yosemite Valley

Noise levels in the area of Segment 2 would remain similar to current conditions. Segment 2 provides the greatest diversity of recreation activities in the Merced River corridor. Day use sites, such as Swinging Bridge, Sentinel Beach, and Cathedral Beach, would continue to exceed capacity, resulting in crowding. These areas would continue to be affected by noise, and noise levels would proportionally rise with the increase of visitors. Noise levels would also continue to be affected by vehicular use. Roads are often crowded during peak months (i.e., near Camp 6, Arch Rock, Wawona proper, Yosemite Lodge). With increased visitation, the frequency and duration of transitory sound sources (i.e., passing vehicles) would also increase. Under Alternative 1, crowding and congestion would contribute to an increase of unnatural sounds that could diminish the natural quiet and sounds of nature that are valued by visitors to the park. The continuation of present visitation trends would, therefore, contribute to a long-term, minor, adverse impact on the soundscape in Segment 2.

Segment 2 Impact Summary: A gradual increase in park visitation, and associated human-caused noise, would contribute to a long-term, negligible to minor, adverse impact on the soundscape environment.

Segments 3 and 4: Merced River Gorge and El Portal

Noise levels in the area of the Merced River gorge and El Portal would remain similar to current conditions. Under Alternative 1, higher noise levels caused by vehicular use near roadways would persist. As with Segment 2, the frequency and duration of transitory sound sources would increase with park visitation. The continued trends in visitor-related noise would result in a long-term, negligible to minor, adverse impact on the soundscape in Segment 3, and a long-term, minor, adverse impact in Segment 4.

Segments 3 & 4 Impact Summary: A gradual increase in park visitation, and associated human-caused noise, would contribute to a long-term, negligible to minor, adverse impact on the soundscape environment in Segment 3, and a long-term, minor, adverse impact on the soundscape within Segment 4.

Segments 5, 6, 7, and 8: South Fork Merced River, Wawona Impoundment, and Wawona

Noise levels in the area of Segments 5, 6, and 8 would remain similar to current conditions. Under Alternative 1, soundscapes in wilderness segments would continue to be dominated by natural sources of sound, punctuated by noise from aircraft and the occasional human voices. Visitor noise levels are not as common because of topography and limited trail access. The increase in visitor-related noise exposure in these areas is speculative due to continued limited accessibility to these portions of the South Fork Merced River. Therefore, it is not known whether visitation to these areas would increase relative to existing conditions.

Noise levels in the area of Segment 7 would remain similar to current conditions. Segment 7 is often crowded with visitors participating in daytime recreation activities, and under Alternative 1 noise levels caused by visitor crowding and congestion would continue, especially during the peak season at popular day use areas. Furthermore, visitation would be expected to increase in these areas, which

would raise noise levels proportionally. The anticipated visitor-related noise would contribute to a long-term, minor, adverse impact on the soundscape in Segment 7.

Segments 5-8 Impact Summary: A gradual increase in park visitation, and associated human-caused noise, would contribute to a long-term, minor, adverse impact on the Segment 7 soundscape environment. The increase in visitor-related noise exposure in Segments 5, 6, and 8 is speculative due to continued limited accessibility to these areas. Therefore, it is not known whether visitation, or associated noise levels within these areas would increase relative to existing conditions.

Summary of Alternative 1 (No Action) Impacts

Alternative 1 would accommodate a gradual increase in annual visitation over the next five years. Shifting visitation trends could result in additional people visiting the park during months outside of the typical peak season (i.e., April, May, September, October) and increasing noise levels during this time. Overall increased visitation would lead to a long-term, negligible to minor, adverse impact on the soundscape environment.

Cumulative Impacts of Alternative 1

The discussion of cumulative impacts on soundscapes is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of Alternative 1. The projects identified below include only those that could affect noise in the Merced River corridor or could be affected by noise sources in the corridor.

Past Actions

Development of facilities over time has created short-term sources of noise from construction and facility removal activities. Examples of past short-term noise sources include: removal of Cascades Housing and Happy Isles Gauging Station Bridge; restoration activities at Cook's Meadow and Happy Isles; construction of housing at Curry Village and rehabilitation of Curry Village structures; and improvements to El Portal Road, Wawona Road, and Yosemite Valley Shuttle bus stops. Overall facility development and increased visitation has resulted in long-term sources of noise.

The *Superintendent's Compendium* and the *1989 Wilderness Management Plan* indirectly limit the overall noise levels in the river corridor. The *Superintendent's Compendium* traffic thresholds were developed for use when traffic and parking conditions in Yosemite Valley are overly congested. The policy has the indirect effect of limiting the amount of vehicle noise during peak periods by restricting the number of automobiles entering certain areas of the park until the traffic volume and parking demand sufficiently decreases. The *Wilderness Management Plan* was developed to preserve a wilderness environment in which the natural world, along with the processes and events that shape it, remain largely untouched by human interference. Implementation of the permit system for overnight camping under the *Wilderness Management Plan* reduces potential noise impacts in those areas where natural quiet is an important element of the visitor experience. A switch to hybrid busses used for the Yosemite shuttle service resulted in a decrease in noise from the old shuttle system.

Present Actions

Utility and road improvements, including the Parkwide Communication Data Network upgrade, would have temporary noise impacts during construction that could affect the Merced River corridor. Temporary noise impacts also occur during some general, ongoing restoration activities.

Reasonably Foreseeable Future Actions

Under Alternative 1, park visitation is expected to increase at a rate of 3% per year over the next five years. Short-term adverse noise effects from construction, rehabilitation and removal projects are reasonably foreseeable. Examples include Ahwahnee Hotel rehabilitation, general restoration activities, rehabilitation to roadways and parking lots, Curry Village rehabilitation and removal of structures in the Curry Village rock fall hazard zone.

Overall Cumulative Impact

Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts, primarily in non-wilderness areas. Increasing numbers of visitors, during both peak and non-peak seasons, could result in long-term, negligible to minor impacts.

Environmental Consequences to Actions Common to Alternatives 2–6

All River Segments

Impacts of Actions to Protect and Enhance River Values

Restorative action in all river segments and under all alternatives could involve the use of heavy equipment which produce short-term, moderate, adverse impacts on the natural soundscape. For purposes of this analysis, heavy equipment in the soundscape discussion includes skid steers, excavators, loaders, and/or dump trucks. With implementation of mitigation measures MM-NOI-1 through MM-NOI-3, as applicable (see Appendix C), impacts of construction on soundscapes would be reduced.

Biological Resource Actions. Program level actions include the removal of informal trails and the removal of campsites from within 100 feet of the ordinary high-water mark. The use of heavy equipment during removal activities would be determined on a project specific basis, but would be expected to have a short-term, negligible to minor adverse soundscape impact. After campsites and informal trails are removed, potential noise sources would be reduced, resulting in a long-term, negligible to minor, beneficial impact on the Merced River corridor's natural soundscape.

Hydrologic/Geologic Resource Actions. Program level actions include the removal of rip rap, abandoned infrastructure where it alters hydrology, management of large wood and the addition of constructed log jams. These actions would involve the use of heavy equipment and/or haul trucks which would have short-term, moderate, adverse impacts on the soundscape in the vicinity of the action.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

As discussed further in “Socioeconomics”, actions to maintain or reduce visitor capacity would likely result in a displacement or “time-shift effect”. Unable to secure reservations for their first-choice time period to visit the park, some people will likely change their plans to visit the park during off-peak periods, such as the fall or winter months. Not all types of accommodations are conducive to this type of time shift. While hard-sided cabin units may be able to accommodate travelers year round, camping and tent accommodations may not work as well in colder seasons. Thus it is anticipated that human-related noise would increase during off-peak periods, primarily in high-use areas. The impact of this time-shift effect would occur under Alternatives 2-6. This would contribute to a long-term, minor, adverse impact on the soundscape environment.

Segment 1: Merced River above Nevada Fall

Impacts of Actions to Protect and Enhance River Values

Programmatic removal and relocation of trails in Segment 1 could involve the use of heavy equipment although this would be determined and further analyzed during a subsequent planning process.

Segment 2: Yosemite Valley

Impacts of Actions to Protect and Enhance River Values

Actions to protect and enhance river values within Segment 2 that would occur across Alternatives 2–6 include removal of abandoned infrastructure and other development affecting the Merced River’s hydrologic function, extensive meadow restoration, and management of high visitor-use areas to address associated impacts on riparian habitats and sensitive cultural resources. These actions would require a temporary noise increase within the vicinity of project sites, resulting from construction activities and vehicle noise. Heavy construction equipment and haul trucks would temporarily add to the noise environment in the project area. Most of these activities would occur in areas distant from noise-sensitive uses. As a result, soundscape/noise impacts resulting from implementation of these actions would be short-term, negligible to minor, adverse impact on soundscapes in the vicinity of these actions.

Biological Resource Actions. Heavy equipment would be used for actions throughout Segment 2 including: formalizing El Portal Road pullouts, ditching in meadows; elevation of a bike path and removal of informal trails in Leidig Meadow; protection of wetlands at Stoneman Meadow; removal of fill, road bed and roadside parking in Cook’s Meadow; removal of the abandoned Rocky Point Sewage Plant; removal of abandoned infrastructure in Royal Arches Meadow; removal of abandoned infrastructure and restoration of the former Lower Pines campground; Eagle Creek drainage channelization; riparian improvements at Swinging Bridge; restoration at Cathedral Beach picnic area; and restoration of the Ahwahnee Meadow former golf course and tennis court area. Operation of this equipment would have a short-term, moderate, adverse impact in the vicinity of the action.

Hydrologic/Geologic Resource Actions. Removal of pack stock trail from concessioner stables to Happy Isles, removal of former Happy Isles footbridge footings, relocation of Upper Pines dump

station, abandoning the gauging station at Pohono Bridge, restoration of floodplain areas at Camp 6, restoration of former Yosemite lodge units and cabin, and riverbank improvements between Clark's and Sentinel Bridges would involve the use of heavy equipment. Operation of this equipment would have a short-term, moderate, adverse impact in the vicinity of the action.

Scenic Resource Actions. Scenic Vista Management (see Appendix H) in Segment 2 under Alternatives 2-6 would largely involve the thinning and removal of trees and shrubs. Areas where more than 200 trees would be removed include Ferry Bend Turnout, The Ahwahnee area, El Capitan Meadow, and Church Bowl Picnic Area. Valley View contains a large number of dead trees from a controlled burn in 2007; over 500 trees could be removed on approximately four acres from Valley View. The impact of scenic resource actions on soundscapes would be short term, moderate and adverse in the vicinity of the actions.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Actions to manage visitor use and facilities in the vicinity of Yosemite Valley, including the removal of several visitor-serving and administrative facilities, removal of employee housing, removal of numerous campsites, and various transportation and parking management measures, would require heavy equipment and construction activity that would yield moderate levels of noise. Construction traffic including heavy construction equipment and haul trucks would temporarily add to the noise environment on local roadways. Noise from demolition/construction work would have a short-term, moderate, adverse impact on the natural soundscape. The overall reduction in visitor and residential facilities would be expected to reduce overall noise levels, contributing to a long-term, minor, beneficial impact on Yosemite Valley soundscape environment.

Curry Village and Campgrounds. The park would remove the Happy Isles Snack Stand at Curry Village. At The Ahwahnee, the park would remove the swimming pool and tennis courts; redesign, formalize, and improve drainage within the existing parking lot; and construct a new 50 parking space lot east of the current parking area. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. Facilities removal would reduce visitor-related noises within those project areas, while the parking lot expansion would have the opposite effect. The long-term impact on the soundscape environment would be local, negligible, and adverse.

Camp 6 and Yosemite Village. The park would remove from Yosemite Village the Concessioner General Office, Concessioner Garage, and the Arts and Activities Center (Bank Building), and repurpose the Village Sports Shop for public use. It would also construct a new maintenance building near the Government Utility Building. The park would remove roadside parking along Sentinel Drive and expand Camp 6 parking into the footprint of the Concessioner Garage. To improve visitor access between the Camp 6 area and Village, the park would construct a pathway connecting the new Camp 6 parking lot with the repurposed Village Sports Shop. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate and adverse. The majority of these actions would occur in a developed area, largely

within the footprint of existing development. As such, the long-term impact on the soundscape environment would be local, negligible, and adverse.

Camp 4 and Yosemite Lodge. The park would remove the NPS Volunteer Office, post office, swimming pool, and snack stand. It would also remove old and temporary employee housing (Thousands Cabins and Highland Court) and replace it with new housing. In addition, the park would relocate the Yosemite Lodge maintenance and housekeeping facilities and repurpose the food court. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. Facilities removal would reduce visitor-related noises within those project areas, and new housing construction would largely occur within already developed areas. As such, the long-term impact on the soundscape environment would be local, negligible, and adverse.

Segment 2 Impact Summary: Actions to protect and enhance river values within Segment 2 would have short-term, moderate, and adverse impacts on the soundscape environment. These actions would not be expected to have a long-term impact on the soundscape environment. Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on the soundscape environment in the vicinity of specific projects.

Segments 3 and 4: Merced River Gorge and El Portal

Impacts of Actions to Protect and Enhance River Values

To protect and enhance river values within the Merced River gorge and El Portal, the park would remove informal trails, nonessential roads, fill materials, and abandoned infrastructure throughout Segments 3 and 4. The planning and design; demolition, removal, transport, and disposal of waste materials; and restoration of these areas would involve the use of heavy equipment. The associated impact on the soundscape environment within Segments 3 and 4 would be short-term, local, minor to moderate, and adverse.

Biological Resource Actions. Removal of asphalt and fill at Trailer Park and Abbieville would involve the use of heavy equipment. Operation of this equipment within Segment 4 would have a short-term, moderate, adverse impact in the vicinity of the action.

Hydrologic/Geologic Resource Actions. Removal of abandoned infrastructure at Cascades Picnic area, restoration of Greenemeyer sand pit, and paving of parking areas at El Portal Maintenance and Administrative Complex would involve the use of heavy equipment. Operation of this equipment within Segment 4 would have a short-term, moderate, adverse impact in the vicinity of the action.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Actions concerning visitor facilities and employee housing that would occur in Segment 4 across Alternatives 2–6 would involve temporary increases in noise from construction and traffic. Noise from construction work is expected to have a short-term, moderate, adverse impact on the natural

soundscape. The construction of new employee housing would contribute to increased noise associated with housing occupation in Rancheria Flat and El Portal. The expected impact on soundscapes would be long-term, minor, and adverse.

Segments 3 & 4 Impact Summary: Actions to protect and enhance river values within Segments 3 & 4 would have short-term, minor to moderate, adverse impacts on soundscapes in the project vicinity. Actions to manage user capacities, land use, and facilities would have short- and long-term, minor, and adverse impacts on the soundscape environment within Segment 4.

Segments 5, 6, 7, and 8: South Fork Merced River, Wawona Impoundment, and Wawona

Impacts of Actions to Protect and Enhance River Values

Actions proposed for Alternatives 2–6 to address campground waste management and protect cultural resources would increase construction and vehicle-related noise in the Segment 7. As a result, noise-sensitive uses near construction operations would be expected to experience a short-term, minor, adverse impact relative soundscapes. Daily operations of the proposed pump station above Wawona Campground would be expected to have a long-term, negligible to minor, adverse impact on nearby residential receivers, including campground users. Noise exposure from daily operations of this facility should be considered upon design.

Hydrologic/Geologic Resource Actions. Development of the Wawona Campground wastewater collection system, abandonment of infrastructure in the South Fork Merced River side channels, and relocation of the Wawona dump station would involve the use of heavy equipment. Operation of this equipment would have a short-term, moderate, adverse impact in the vicinity of the action. Daily operations of the proposed pump station above Wawona Campground would be expected to have a long-term, negligible to minor, adverse impact on nearby residential receivers and recreational park users within Segment 7. Noise exposure from daily operations of this facility should be considered upon design.

Cultural Resource Actions. The removal of campsites from culturally sensitive areas would reduce long-term noise exposure in Segment 7. This action would have a long-term, negligible, beneficial impact on the soundscape environment in the area of the action.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Proposed actions concerning visitor and administrative facilities and parking, including enhancing river access, restroom, picnic, and bus stops within Wawona; removing staged materials, abandoned utilities, vehicles, and a parking lot from the riparian buffer at the Wawona Maintenance Yard; and removing roadside parking between the Wawona Store and Chilnualna Falls Road would introduce temporary project-related increases in construction and traffic noise in Segment 7. Noise from construction activities within Segment 7 would have a short-term, moderate, adverse impact on the natural soundscape. Operational noise associated with the proposed administrative facilities in Wawona may have long-term, minor to moderate, adverse impacts on existing noise-sensitive uses in

the vicinity. Site-specific acoustical studies would be appropriate to address noise mitigation from these facilities at existing noise-sensitive uses within 1,000 feet.

Wawona. The park would redesign the bus stop at the Wawona Store to accommodate increased visitor use. This project would mostly be completed by the use of hand and power tools. The resulting impact on the soundscape environment in the project vicinity would be short-term, negligible, and adverse.

Segments 5-8 Impact Summary: Actions to protect and enhance river values within Segment 7 would result in local, short-term, negligible to minor, adverse impacts; but would not be expected to have long-term impacts. Operational noise at new administrative facilities would contribute to local, long-term, minor to moderate, adverse impacts on the soundscape environment.

Summary of Impacts Common to Alternatives 2–6

Temporary noise from heavy equipment and construction would be a short term, local, moderate, adverse impact from proposed actions. The acoustical environment in wilderness areas would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in nonwilderness areas would continue to be shaped primarily by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. With implementation of mitigation measures MM-NOI-1 through MM-NOI-3, as applicable (see Appendix C), the long-term impact on the park's natural soundscape would be local, minor to moderate, and beneficial, resulting mainly from removal of visitor serving facilities and employee housing in Segment 2.

Environmental Consequences of Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration

Segment 1: Merced River above Nevada Fall

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Changes to the trailhead quota system and camping area modifications would reduce long-term noise exposure in these areas, having an overall long-term, negligible to minor, beneficial impact on soundscapes.

Merced Lake High Sierra Camp. The park would close the Merced Lake High Sierra Camp and remove all associated infrastructure, convert the area to designated Wilderness, and expand dispersed camping at Merced Lake Backpackers Camping Area into the former High Sierra Camp footprint. These actions would require construction efforts which would yield construction noise. In addition, such work would likely require several helicopter trips to transport camp infrastructure. Where these operations are near sensitive receivers, such as occupied campsites, they would be expected to have short-term, moderate, adverse impacts on soundscapes in the vicinity.

Segment 1 Impact Summary: Actions to manage user capacities, land use, and facilities within Segment 1 would have short-term, moderate, adverse impacts due to construction noise; but have an overall long-term, negligible to minor, beneficial impact on soundscapes due to reduced visitation.

Segment 2: Yosemite Valley

Impacts of Actions to Protect and Enhance River Values

Projects proposed in Segment 2 to protect and enhance river values involve removal of buildings from the Yosemite Lodge area, and rerouting and revegetating a portion of the Valley Loop Trail. This work would require the use of heavy equipment and likely take several weeks to a few months to complete. The resulting impacts on the natural soundscape environment within these areas would be short-term, minor to moderate, and adverse.

Biological Resource Actions. In Segment 2, restorative actions including removal of portions of Northside Drive, restoration at Stoneman and El Capitan Meadows, redesign of Curry Orchard Parking lot, removal of abandoned infrastructure and Upper and Lower Rivers Campground, removal of campsites in Yosemite Valley campgrounds, and rerouting of trail in various meadows, would include the use of heavy equipment which would have short-term, moderate, adverse impacts.

Hydrologic/Geologic Resource Actions. The removal of Awhawnee and Sugar Pine bridges and associated berms under Alternative 2 would involve the use of heavy equipment and explosives to drop the bridges and dismantle the abutments. Operation of this equipment would have a short-term, moderate to major, adverse impact in the vicinity of the action.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Actions to manage visitor use and facilities under Alternative 2, including removal of lodging and campsites, parking improvements at Curry Village and Camp 6, and new camping and parking facilities at Yosemite Lodge, would involve the use of heavy equipment. Construction noise and associated traffic would have a short-term, moderate, adverse impact. The reduction in lodging, campsites, and overall visitation would combine to reduce noise within these areas of Yosemite Valley, resulting in a long-term, minor to moderate, beneficial impact on the soundscape environment.

New camping and parking facilities would result in long-term, minor, adverse impacts to soundscapes while the removal of campsites and parking would result in long-term, minor, beneficial impacts in other areas. Some of these actions may also have long-term beneficial implications for the Yosemite Valley's soundscape environment. For example, removal of campsites from the floodplain and closure of Housekeeping Camp would reduce long-term noise exposure in the affected areas, having an overall long-term, negligible to minor, beneficial impact on the soundscape environment.

Curry Village and Campground. The park would construct 78 new hard-sided units in Boys Town, bringing the total number of new and retained units at Curry Village to 433. The park would remove campsites from Lower Pines (32), North Pines (86), and Upper Pines (24). In addition, the park would discontinue commercial day rides from the Curry Village Stables. Several of these actions would

require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. Facilities removal would reduce visitor-related noises within those project areas, while the construction of new units would have the opposite effect. The long-term impact on the soundscape environment would be local, minor, and beneficial.

Camp 6 and Yosemite Village. The park would reroute Northside Drive to the south of the Yosemite Village day-use parking area, reconfigure the lot to accommodate a total of 550 parking spaces north of the road, and install walkways leading to Yosemite Village. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate and adverse. The majority of these actions would occur in a developed area, largely within the footprint of existing development. As such, the long-term impact on the soundscape environment would be local, negligible, and adverse.

Camp 4 and Yosemite Lodge. The park would move on-grade pedestrian crossing Camp 4 and Yosemite Lodge. The park would convert the Highland Court area to a walk-in campground; reconfigure pedestrian crossing of Northside Drive and Yosemite Lodge Drive, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. The latter actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. The majority of these actions would occur in close proximity to existing development. As such, the long-term impact on the soundscape environment would be local, negligible, and adverse.

Segment 2 Impact Summary: Actions to protect and enhance river values within Segment 2 would have short-term, minor to moderate, and adverse impacts on the soundscape environment. Actions to manage user capacities, land use, and facilities would also have short-term, local, minor to moderate, adverse, impacts on Segment 2 soundscapes. However, the long-term impacts would be local, minor to moderate, and beneficial.

Segments 3 and 4: Merced River Gorge and El Portal

Impacts of Actions to Protect and Enhance River Values

Proposed actions to protect and restore areas around valley oaks in Segment 4, such as the demolition and removal of Odgers bulk fueling facility, would require the use of heavy equipment which would result in short-term, moderate, adverse impacts on soundscapes in the project vicinity.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Management actions to address facilities under Alternative 2, specifically campsite and new employee housing development, would temporarily increase noise from construction activity and project vehicles on nearby roadways. Heavy construction equipment and haul trucks would temporarily add to the noise environment in the project vicinity. Noise from demolition/construction work would be

expected to have a short-term, moderate, adverse impact on noise-sensitive uses in the vicinity. The construction of new employee housing would contribute to increased noise associated with housing occupation in Rancheria Flatt and Abbeville. The expected impact on soundscapes would be long-term, minor, and adverse.

Segments 3 & 4 Impact Summary: Actions to protect and enhance river values within Segment 4 would have short-term, moderate, adverse impacts on soundscapes in the project vicinity. These actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have long-term, minor, adverse impacts on the soundscape environment within Segment 4.

Segments 5, 6, 7, and 8: South Fork Merced River Wawona Impoundment, and Wawona

Impacts of Actions to Protect and Enhance River Values

Restoration activities in Segment 7, including the removal of Wawona Golf Course, would increase construction-related noise in the general work vicinity, and project vehicles would add to the existing traffic noise production from nearby roadways. Noise from demolition/construction work would produce a short-term, minor, adverse impact at noise-sensitive uses in the vicinity. In the long-term the removal of the golf course would result in minor, beneficial impacts as maintenance- and visitor-related sources of noise in this area would be eliminated.

Biological Resource Actions. Restoration activities, including relocation of two stock use campgrounds, would involve heavy equipment which would have a short-term, minor, adverse impact in the vicinity of the action within Segment 7.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Elimination of concessioner stable operations and day rides and restroom improvements at Wawona would result in short-term, minor to moderate, adverse impacts on soundscapes in the vicinity from construction noise. Reduced activity in the vicinity would contribute to a long-term, negligible, beneficial impact.

Wawona Campground: Under Alternative 2, the park would reduce the size of the Wawona Campground. Thirty-two campsites, or 33% of all campsites within Wawona, would be removed from the floodplain. Equipment required to remove these facilities would have short-term, moderate, adverse impacts on area soundscapes. However, the removal of campsites would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact on the soundscape environment within Segment 7 environment.

Segments 5-8 Impact Summary: Actions to protect and enhance river values within Segment 7 would result in local, long-term, minor, beneficial impacts. Actions to manage user capacity, land use, and facilities would reduce a long-term noise exposure, contributing to local, negligible, beneficial impacts on the soundscape environment.

Summary of Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration

The acoustical environment in Yosemite Wilderness would benefit from the removal of the Merced Lake High Sierra Camp and modifications to the trailhead quota system. Wilderness would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in nonwilderness areas would continue to be shaped primarily by noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Care should be taken to assess potential noise production from future uses. Temporary noise from restoration and construction operations would add to the noise environment, producing short-term, moderate, adverse noise impacts in construction areas. The construction of new facilities, namely housing and campgrounds, would produce long-term, minor, noise impacts in the vicinity of such facilities, while removal activities would have the opposite effect. Overall, with implementation of mitigation measures MM-NOI-1 through MM-NOI-3, as applicable (see Appendix C), noise would be reduced relative to Alternative 1, resulting in local, long-term, minor to moderate, benefits to soundscapes in the Merced River corridor.

Cumulative Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration

The discussion of cumulative impacts on soundscapes is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of the actions common to Alternatives 2–6. The cumulatively considerable projects are the same as those identified for Alternative 1, above, and include only those projects that could affect noise in the Merced River corridor or could be affected by noise sources in the corridor.

Overall Cumulative Impact

Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts, primarily in nonwilderness areas. The construction of new facilities, such as employee housing, would contribute to long-term, minor, adverse noise impacts to soundscapes in the vicinity of these facilities. However, these long-term increases would be offset by long-term, moderate, beneficial impacts from removal of housing and facilities in other areas of the Merced River corridor.

Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration

Segment 1: Merced River above Nevada Fall

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Changes to the trailhead quota system and removal of the Merced Lake High Sierra Camp would reduce noise exposure in Segment 1, having an overall long-term, negligible to minor, beneficial impact on soundscapes.

Merced Lake High Sierra Camp. The park would close the Merced Lake High Sierra Camp and remove all infrastructure, convert the area to designated Wilderness, and use the former camp area for a temporary stock camp. These actions would require construction efforts that would yield construction noise. In addition, such work would likely require several helicopter trips to transport camp infrastructure. This noise would be short-term due to the temporary nature of the operations. Where these operations are near sensitive receivers, such as occupied campsites, they would be expected to produce short-term, moderate, adverse impacts on soundscapes in the vicinity. Where they are not near sensitive receivers, the noise impacts of these actions would be negligible.

Segment 1 Impact Summary: Actions to manage user capacities, land use, and facilities within Segment 1 would have short-term, moderate, adverse impacts due to construction noise; but have an overall long-term, negligible to minor, beneficial impact on soundscapes due to reduced visitation.

Segment 2: Yosemite Valley

Impacts of Actions to Protect and Enhance River Values

Projects proposed in Segment 2 to protect and enhance river values involve removal of buildings from the Yosemite Lodge area, and rerouting and revegetating a portion of the Valley Loop Trail. This work would require the use of heavy equipment and likely take several weeks to a few months to complete. The resulting impacts on the natural soundscape environment within these areas would be short-term, minor to moderate, and adverse.

Biological Resource Actions. In Segment 2, restorative actions including removal of portions of Northside Drive, restoration at Stoneman and El Capitan Meadows, redesign and reduction in size of Curry Orchard Parking lot, removal of abandoned infrastructure and Upper and Lower Rivers Campground, removal of campsites in Valley campgrounds, and rerouting of trail in various meadows, would include the use of heavy equipment which would have short-term, moderate, adverse impacts.

Hydrologic/Geologic Resource Actions. The removal of Awhawnee and Sugar Pine bridges and associated berms under Alternative 3 would involve the use of heavy equipment and explosives to drop the bridge and dismantle the abutments. Operation of this equipment would have a short-term, moderate to major, adverse impact in the vicinity of the action.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Actions to manage visitor use and facilities under Alternative 3, including work at Curry Village and west of Yosemite Lodge, new housing development at Yosemite Lodge, new camping facilities east of Camp 4 and at Upper Pines Campground, along with several small transit and pedestrian access improvements, would require construction efforts and the use of heavy equipment. Construction noise would have a short-term, moderate, adverse impact.

New camping and parking facilities would result in long-term, minor impacts to soundscapes while the removal of campsites and parking would result in long-term, minor, beneficial impacts in other areas. Some of these actions may also have long-term beneficial implications for the Yosemite Valley's

soundscape environment. For example, removal of campsites from the floodplain and closure of Housekeeping Camp would reduce long-term noise exposure in the affected areas, having an overall long-term, negligible to minor, beneficial impact on the soundscape environment.

Curry Village and Campground. The park would retain 355 guest units at Curry Village. The park would remove campsites from Lower Pines (15), North Pines (34), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. Several of these actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. Facilities removal would reduce visitor-related noises within those project areas. The long-term impact on the soundscape environment would be local, minor, and beneficial.

Camp 6 and Yosemite Village. The park would reroute Northside Drive to the south of the Yosemite Village day-use parking area, reconfigure the lot to accommodate a total of 550 parking spaces north of the road, and install walkways leading to Yosemite Village. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate and adverse. The majority of these actions would occur in a developed area, largely within the footprint of existing development. As such, the long-term impact on the soundscape environment would be local, negligible, and adverse.

Camp 4 and Yosemite Lodge. The park would move on-grade pedestrian crossing to west of the Northside Drive and Yosemite Lodge Drive, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. The latter actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. The majority of these actions would occur in close proximity to existing development. As such, the long-term impact on the soundscape environment would be local, negligible, and adverse.

Segment 2 Impact Summary: Actions to protect and enhance river values within Segment 2 would have short-term, minor to moderate and adverse impacts on the soundscape environment, but would not be expected to have long-term impacts. Actions to manage user capacities, land use, and facilities would local, long-term, minor to moderate, beneficial impacts on the soundscape environment.

Segments 3 and 4: Merced River Gorge and El Portal

Impacts of Actions to Protect and Enhance River Values

Proposed actions to protect and restore areas around valley oaks in Segment 4, such as the demolition and removal of Odgers bulk fueling facility, would require the use of heavy equipment which would result in short-term, moderate, adverse impacts on soundscapes in the project vicinity.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Management actions to address facilities under Alternative 3, specifically new employee housing development, would temporarily increase noise from construction activity and project vehicles on nearby roadways. Heavy construction equipment and haul trucks would temporarily add to the noise environment in the project vicinity. Increases in exposure to local roadway traffic noise. Noise from demolition/construction work would be expected to have a short-term, moderate, adverse impact on noise-sensitive uses in the vicinity. The construction of new employee housing would contribute to increased noise associated with housing occupation in El Portal. The expected impact on soundscapes would be long-term, minor, and adverse.

Segments 3 & 4 Impact Summary: Actions to protect and enhance river values within Segment 4 would have short-term, moderate, adverse impacts on soundscapes in the project vicinity, but would not be expected to have long-term impacts. Actions to manage user capacities, land use, and facilities would have long-term, negligible to minor, adverse impacts on the soundscape environment within Segment 4.

Segment 5, 6, 7, and 8: South Fork Merced River Wawona Impoundment, and Wawona*Impacts of Actions to Protect and Enhance River Values*

Restoration activities in Segment 7, including those at the Wawona Golf Course, would increase construction-related noise in the general work vicinity, and project vehicles would add to the existing traffic noise production from nearby roadways. Heavy construction equipment and haul trucks would temporarily add to the noise environment in the project vicinity. Noise from demolition/construction work would produce a short-term, minor, adverse impact at noise-sensitive uses in the vicinity. In the long-term the removal of the golf course would result in minor, beneficial impacts as maintenance- and visitor-related sources of noise in this area would be eliminated.

Biological Resource Actions. Restoration activities, including relocation of two stock use campgrounds from Segment 7, would involve heavy equipment which would have a short-term, minor, adverse impact in the vicinity of the action.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Elimination of the concessioner stable operations and day rides and restroom improvements at Wawona would result in short-term, minor to moderate, adverse impacts on soundscapes in the vicinity from construction noise. Reduced activity in the vicinity would contribute to a long-term, negligible, beneficial impact.

Wawona Campground. Under Alternative 3, the park would reduce the size of the Wawona Campground. Twenty seven campsites, or 28% of all campsites within Wawona, would be removed from the floodplain. Equipment required to remove these facilities would have short-term, moderate, adverse impacts on area soundscapes. However, the removal of campsites would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact on the soundscape environment within Segment 7.

Segments 5-8 Impact Summary: Actions to protect and enhance river values within Segment 7 would result in local, long-term, minor, beneficial impacts. Actions to manage user capacity, land use, and facilities would reduce n long-term noise exposure, contributing to local, negligible, beneficial impacts on the soundscape environment.

Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration

The acoustical environment in Yosemite Wilderness would benefit from the removal of the Merced Lake High Sierra Camp and modifications to the trailhead quota system. Wilderness would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in nonwilderness areas would continue to be shaped primarily by noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Care should be taken to assess potential noise production from future uses. Temporary noise from restoration and construction operations would add to the noise environment, producing short-term, moderate, adverse noise impacts in construction areas. The construction of new facilities, namely housing and campgrounds, would produce long-term, minor, noise impacts in the vicinity of such facilities, while removal activities would have the opposite effect. Overall, with implementation of mitigation measures MM-NOI-1 through MM-NOI-3, as applicable (see Appendix C), noise would be reduced relative to Alternative 1, resulting in local, long-term, minor to moderate benefits to soundscapes in the Merced River corridor.

Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration

The discussion of cumulative impacts on soundscapes is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of the actions common to Alternatives 2–6. The cumulatively considerable projects would be the same as those identified for Alternative 1, above, and include only those that could affect noise in the Merced River corridor or could be affected by noise sources in the corridor.

Overall Cumulative Impact

Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts, primarily in non-wilderness areas. The construction of new facilities, such as employee housing, would contribute to long-term, minor, adverse noise impacts to soundscapes in the vicinity of these facilities. However, these long-term increases would be offset by long-term, minor, beneficial impacts from removal of housing and facilities in other areas of the Merced River corridor.

Environmental Consequences of Alternative 4: Resource-Based Visitor Experiences and Targeted Riverbank Restoration

Segment 1: Merced River above Nevada Fall

Impacts of Actions to Protect and Enhance River Values

The park proposes no actions to protect and enhance river values in Segment 1 that would occur only under Alternative 4.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Changes to the trailhead quota system and removal of the Merced Lake High Sierra Camp would reduce noise exposure in Segment 1, having an overall long-term, negligible to minor, beneficial impact on the soundscape environment.

Merced Lake High Sierra Camp. The park would close the Merced Lake High Sierra Camp and removal all infrastructure, convert the area to designated Wilderness, and restoration of the former camp area to natural conditions. These actions would require construction efforts that would yield construction noise. In addition, such work would likely require several helicopter trips to transport camp infrastructure. This noise would be short-term due to the temporary nature of the operations. Where these operations are near sensitive receivers, such as occupied campsites, they would be expected to have short-term, moderate, adverse impacts on soundscapes in the vicinity.

Segment 1 Impact Summary: Actions to Manage User Capacities, Land Use, and Facilities within Segment 1 would have short-term, moderate, adverse impacts due to construction noise; but have an overall long-term, negligible to minor, beneficial impact on soundscapes due to reduced visitation.

Segment 2: Yosemite Valley

Impacts of Actions to Protect and Enhance River Values

Within Segment 2, restorative actions to protect and enhance river values, such as parking area relocation, and trail and shoreline access management measures, would increase temporary demolition/construction noise and project-related vehicle noise in the project areas. Heavy construction equipment and would temporarily add to the noise environment in the project vicinity. Noise from demolition/construction work would have a short-term, minor, adverse impact on noise-sensitive uses in the vicinity.

Biological Resource Actions. In Segment 2, restoration at Housekeeping Camp and Stoneman Meadow, redesign and reduction in size of Curry Orchard Parking lot, removal of abandoned infrastructure at Upper and Lower Rivers Campground, removal of campsites in Valley campgrounds, and rerouting of trail in various meadows, would include the use of heavy equipment which would have short-term, moderate, adverse impacts.

Hydrologic/Geologic Resource Actions. The removal of Awhawnee and Sugar Pine bridges and associated berms under Alternative 4 would involve the use of heavy equipment and explosives to drop the bridge and dismantle the abutments. Operation of this equipment would have a short-term, moderate to major, adverse impact in the vicinity of the action.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Actions to manage visitor use and facilities under Alternative 4, including the removal of lodging units, construction of new campgrounds, and parking improvements at Curry Village, Camp 6, and Yosemite Lodge, would require construction efforts that would involve heavy equipment. Construction noise would have a short-term, moderate, adverse impact.

New camping and parking facilities would result in long-term, minor impacts to soundscapes while the removal of campsites and parking would result in long-term, minor, beneficial impacts in other areas.

Curry Village and Campground. The park would retain 355 guest units and construct a new 40 site campground at Curry Village. The park would remove campsites from Lower Pines (15), North Pines (34), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. Several of these actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. Facilities removal would reduce visitor-related noises within those project areas. The long-term impact on the soundscape environment would be local, minor, and beneficial.

Camp 6 and Yosemite Village. The park would improve the configuration of and on-grade pedestrian crossing at the Northside Drive-Yosemite Village Drive intersection, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 750 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate and adverse. The majority of these actions would occur in a developed area, largely within the footprint of existing development. However, the increase in parking availability would likely increase visitor-related noise in the vicinity of the parking lot. As such, the long-term impact on the soundscape environment would be local, negligible to minor, and adverse.

Camp 4 and Yosemite Lodge. The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. The latter actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. The majority of these actions would occur in close proximity to existing development. As such, the long-term impact on the soundscape environment would be local, negligible, and adverse.

Segment 2 Impact Summary: Actions to protect and enhance river values within Segment 2 would have short-term, minor, adverse impacts on the soundscape environment, but would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would local, long-term, minor, beneficial impacts on the soundscape environment.

Segments 3 and 4: Merced River Gorge and El Portal

Impacts of Actions to Protect and Enhance River Values

Biological Resource Actions. Proposed actions to protect and restore areas around valley oaks in Segment 4, such as the demolition and removal of Odgers bulk fueling facility, would require the use of heavy equipment which would result in short-term, moderate, adverse impacts on soundscapes in the project vicinity.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Management actions to address facilities under Alternative 4, specifically new employee housing development, would temporarily increase noise from construction activity and project vehicles on nearby roadways. Heavy construction equipment and haul trucks would temporarily add to the noise environment in the project vicinity. Noise from demolition/construction work would be expected to have a short-term, moderate, adverse impact on noise-sensitive uses in the vicinity. The construction of new employee housing would contribute to increased noise associated with housing occupation in Rancheria. The expected impact on soundscapes within Segment 4 would be long-term, minor, and adverse.

Segments 3 & 4 Impact Summary: Actions to protect and enhance river values within Segment 4 would have short-term, moderate, adverse impacts on soundscapes in the project vicinity, but would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have long-term, minor, adverse impacts on the soundscape environment within Segment 4.

Segments 5, 6, 7, and 8: South Fork Merced River Wawona Impoundment, and Wawona

Impacts of Actions to Protect and Enhance River Values

Biological Resource Actions. Restoration activities, including relocation of two stock use campgrounds within Segment 7, would involve heavy equipment which would have a short-term, moderate, adverse impact in the vicinity of the action.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Elimination of the concessioner stable operations and day rides, campsite removal and relocation, and restroom improvements at Wawona would result in short-term, moderate, adverse impacts on soundscapes in the vicinity from construction noise. The removal of campsites from culturally

sensitive areas would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact on the soundscape environment within Segment 7.

Wawona Campground. Under Alternative 4, the park would reduce the size of the Wawona Campground. Twenty-seven campsites, or 28% of all campsites within Wawona, would be removed from the floodplain. Equipment required to remove these facilities would have short-term, moderate, adverse impacts on area soundscapes. However, the removal of campsites would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact on the soundscape.

Segments 5-8 Impact Summary: Actions to protect and enhance river values within Segment 7 would result in local, long-term, minor, beneficial soundscape impact. Actions to manage user capacity, land use, and facilities would reduce long-term noise exposure, contributing to local, negligible, beneficial impacts on the soundscape environment.

Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration

The acoustical environment in Yosemite Wilderness would benefit from the removal of the Merced Lake High Sierra Camp and modifications to the trailhead quota system. Wilderness would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in nonwilderness areas would continue to be shaped primarily by noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Care should be taken to assess potential noise production from future uses. Temporary noise from restoration and construction operations would add to the noise environment, producing short-term, moderate, adverse noise impacts in construction areas. The construction of new facilities, namely housing and campgrounds, would produce long-term, minor, noise impacts in the vicinity of such facilities, while removal activities would have the opposite effect. Overall, with implementation of mitigation measures MM-NOI-1 through MM-NOI-3, as applicable (see Appendix C), noise would be reduced relative to Alternative 1, resulting in local, long-term, minor benefits to soundscapes in the Merced River corridor.

Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration

The discussion of cumulative impacts on soundscapes is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of the actions common to Alternatives 2–6. The cumulatively considerable projects would be the same as those identified for Alternative 1, above, and include only those that could affect noise in the Merced River corridor or could be affected by noise sources in the corridor.

Overall Cumulative Impact

Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts, primarily in non-wilderness areas. The construction of new facilities, such as employee housing, would contribute to long-term, minor, adverse noise impacts to soundscapes in the

vicinity of these facilities. However, these long-term increases would be offset by long-term, minor, beneficial impacts from removal of housing and facilities in other areas of the Merced River corridor.

Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential River Bank Restoration

Segment 1: Merced River above Nevada Fall

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Alternative 5 actions related to visitor use and facilities in Segment 1, including removal of certain facilities and infrastructure, would require construction efforts that would yield construction noise. In addition, such work would likely require several helicopter trips to transport camp infrastructure. This noise would be short-term due to the temporary nature of the operations. Where these operations are near sensitive receivers, such as occupied campsites, they would be expected to have short-term, moderate, adverse impacts on soundscapes in the vicinity.

Merced Lake High Sierra Camp. The park would reduce the capacity of the Merced Lake High Sierra Camp to 42 beds and replace the flush toilets with composting toilets. The effort and equipment required to remove these facilities would be similar to that described above, resulting in a short-term, moderate, adverse impact on soundscapes in the vicinity of the Camp. Reductions in the number of Merced Lake High Sierra Camp overnight visitors would reduce noise exposure in Segment 1, having an overall long-term, negligible, beneficial impact on soundscapes.

Segment 1 Impact Summary: Actions to manage user capacities, land use, and facilities within Segment 1 would have short-term, moderate, adverse impacts due to construction noise; but have an overall long-term, negligible, beneficial impact on soundscapes due to reduced visitation.

Segment 2: Yosemite Valley

Impacts of Actions to Protect and Enhance River Values

Projects proposed in Segment 2 to protect and enhance river values involve rerouting, revegetating, and constructing a boardwalk along a portion of the Valley Loop Trail. This work would require the use of heavy equipment and haul trucks. As such, the work associated with these actions would result in a short-term, minor to moderate, adverse impact on Segment 2 soundscapes.

Biological Resource Actions. In Segment 2, restoration at Housekeeping Camp and Stoneman Meadow, removal of abandoned infrastructure at Upper and Lower Rivers Campground, removal of campsites in Valley campgrounds, and rerouting of trail in various meadows, would include the use of heavy equipment which would have short-term, moderate, adverse impacts.

Hydrologic/Geologic Resource Actions. The removal of Sugar Pine Bridges and its associated berm under Alternative 5 would involve the use of heavy equipment and explosives to drop the bridge and

dismantle the abutments. Operation of this equipment would have a short-term, moderate to major, adverse impact in the vicinity of the action.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Actions to manage visitor use and facilities under Alternative 5, including the removal of lodging units, construction of new campgrounds, and parking improvements at Curry Village, Camp 6, and Yosemite Lodge, would require construction efforts that involve the use of heavy equipment. Construction noise and associated traffic would have a short-term, moderate, adverse impact. New camping and parking facilities would result in long-term, minor impacts to soundscapes while the removal of campsites and parking would result in long-term, minor, beneficial impacts in other areas.

Curry Village and Campground. The park would construct 98 hard-sided units at Boys Town, bringing the total number of new and retained units at Curry Village to 453. The park would remove campsites from Lower Pines (5), North Pines (14), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. Several of these actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. Facilities removal would reduce visitor-related noises within those project areas, while the construction of new units would have the opposite effect. The long-term impact on the soundscape environment would be local, negligible, and adverse.

Camp 6 and Yosemite Village. The park would construct a pedestrian underpass and a traffic circle at the intersection of Northside and Yosemite Village Drives, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 850 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate and adverse. The majority of these actions would occur in a developed area, largely within the footprint of existing development. However, the increase in parking availability would likely increase visitor-related noise in the vicinity of the parking lot. As such, the long-term impact on the soundscape environment would be local, minor, and adverse.

Camp 4 and Yosemite Lodge. The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 300 automobiles and 15 tour busses. The latter actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. The majority of these actions would occur in close proximity to existing development. As such, the long-term impact on the soundscape environment would be local, minor, and adverse.

Segment 2 Impact Summary: Actions to protect and enhance river values within Segment 2 would have short-term, minor to moderate, adverse impacts on the soundscape environment, but would not

be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have local, long-term, negligible to minor, beneficial impacts on the soundscape environment.

Segments 3 and 4: Merced River Gorge and El Portal

Impacts of Actions to Protect and Enhance River Values

Proposed actions to protect and restore areas around valley oaks in Segment 4, such as the demolition and removal of Odgers bulk fueling facility, would require the use of heavy equipment which would result in short-term, moderate, adverse impacts on soundscapes in the project vicinity.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Management actions to address facilities under Alternative 5, namely new employee housing development, would temporarily increase noise from construction activity and project vehicles on nearby roadways. Heavy construction equipment and haul trucks would temporarily add to the noise environment in the project vicinity. Noise from demolition/construction work would be expected to have a short-term, moderate, adverse impact on noise-sensitive uses in the vicinity. The construction of new employee housing would contribute to increased noise associated with housing occupation in Rancheria. The expected impact on Segment 4 soundscapes would be long-term, minor, and adverse.

Segments 3 & 4 Impact Summary: Actions to protect and enhance river values within Segment 4 would have short-term, moderate, adverse impacts on soundscapes in the project vicinity, but would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have long-term, minor, adverse impacts on the soundscape environment within Segment 4.

Segments 5, 6, 7, and 8: South Fork Merced River Wawona Impoundment, and Wawona

Impacts of Actions to Protect and Enhance River Values

Biological Resource Actions. Restoration activities, including relocation of two stock use campgrounds, would involve heavy equipment which would have a short-term, moderate, adverse impact on the Segment 7 soundscape environment.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Campsite removal and relocation, and restroom improvements at Wawona, would require construction efforts that would result in short-term, moderate, adverse impacts on soundscapes in the vicinity from construction noise.

Wawona Campground. Under Alternative 5, the park would reduce the size of the Wawona Campground. Thirteen campsites, or 13% of all campsites within Wawona, would be removed from the floodplain. Equipment required to remove these facilities would have short-term, moderate,

adverse impacts on area soundscapes. However, the removal of campsites would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact on the soundscape.

Segments 5-8 Impact Summary: Actions to protect and enhance river values within Segment 7 would result in local, long-term, minor, beneficial impacts. Actions to manage user capacity, land use, and facilities would reduce long-term noise exposure, contributing to local, negligible, beneficial impacts on the soundscape environment.

Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration

The acoustical environment in Yosemite Wilderness would benefit from the removal of the Merced Lake High Sierra Camp and modifications to the trailhead quota system. Wilderness would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in nonwilderness areas would continue to be shaped primarily by noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Care should be taken to assess potential noise production from future uses. Temporary noise from restoration and construction operations would add to the noise environment, producing short-term, moderate, adverse noise impacts in construction areas. The construction of new facilities, namely housing and campgrounds, would produce long-term, minor, noise impacts in the vicinity of such facilities, while removal activities would have the opposite effect. Overall, with implementation of mitigation measures MM-NOI-1 through MM-NOI-3, as applicable (see Appendix C), noise would be reduced relative to Alternative 1, resulting in local, long-term, negligible to minor benefits to soundscapes in the Merced River corridor.

Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration

The discussion of cumulative impacts on soundscapes is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of the actions common to Alternatives 2–6. The cumulatively considerable projects would be the same as those identified for Alternative 1, above, and include only those that could affect noise in the Merced River corridor or could be affected by noise sources in the corridor.

Overall Cumulative Impact

Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts, primarily in non-wilderness areas. The construction of new facilities, such as employee housing, would contribute to long-term, minor, adverse noise impacts to soundscapes in the vicinity of these facilities. However, these long-term increases would be offset by long-term, minor, beneficial impacts from removal of housing and facilities in other areas of the Merced River corridor.

Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration

Segment 1: Merced River above Nevada Fall

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Alternative 6 actions related to visitor use and facilities in Segment 1, including removal and replacement of certain facilities and infrastructure, would require construction efforts that would yield construction noise. In addition, such work may require one or more helicopter trips to transport camp infrastructure. This noise would be short-term due to the temporary nature of the operations. Where these operations are near sensitive receivers, such as occupied campsites, they would be expected to have short-term, minor to moderate, adverse impacts on soundscapes in the vicinity.

Merced Lake High Sierra Camp. The park would retain the Merced Lake High Sierra Camp and replace the flush toilets with composting toilets. The effort and equipment required to undertake these actions would be similar to that described above, resulting in a short-term, minor to moderate, adverse impact on soundscapes in the vicinity of the Camp.

Segment 1 Impact Summary: Actions to manage user capacities, land use, and facilities within Segment 1 would have short-term, minor to moderate, adverse impacts due to construction noise, but would not be expected to have any appreciable long-term impacts.

Segment 2: Yosemite Valley

Impacts of Actions to Protect and Enhance River Values

Projects proposed in Segment 2 to protect and enhance river values involve removing buildings from the Yosemite Lodge area, and rerouting, revegetating, and constructing a boardwalk along a portion of the Valley Loop Trail. This work would require the use of heavy equipment and likely take several weeks to a few months to complete. The resulting impacts on the natural soundscape environment within these areas would be short-term, minor to moderate, and adverse.

Biological Resource Actions. In Segment 2, restoration at Housekeeping Camp and Stoneman Meadow, removal of abandoned infrastructure at Upper and Lower Rivers Campground, removal of campsites in Valley campgrounds, and rerouting of trail in various meadows, would include the use of heavy equipment which would have short-term, moderate, adverse impacts. Under this alternative, Sugar Pine Bridge would be retained, constructed log jams and large wood installed at its base, and its condition monitored. Should long-term monitoring reveal mitigation measures are not sufficient, the park may undertake more aggressive management action, including removal of the bridge. Such action would require the use of heavy equipment and explosives to drop the bridge and dismantle the abutments. In this scenario, the impact on the Segment 2 soundscape environment would be short-term, moderate to major, and adverse.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Actions to manage visitor use and facilities under Alternative 6, including parking improvements at Curry Village, Camp 6, and in the vicinity of Yosemite Lodge, and new lodging units and campsites at several locations, would require construction efforts that would produce construction noise.

Construction noise would have a short-term, moderate, adverse impact. New camping and parking facilities would result in long-term, minor impacts to soundscapes while the removal of campsites and parking would result in long-term, minor, beneficial impacts in other areas.

Curry Village and Campground. The park would construct 98 hard-sided units at Boys Town, bringing the total number of new and retained units at Curry Village to 453. The park would remove campsites from Lower Pines (5), North Pines (14), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. Several of these actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. Facilities removal would reduce visitor-related noises within those project areas, while the construction of new units would have the opposite effect. The long-term impact on the soundscape environment would be local, negligible, and adverse.

Camp 6 and Yosemite Village. The park would expand the Concessioner Warehouse Building to accommodate Concessioner General Office functions, construct a pedestrian underpass and two roundabouts, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 850 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate and adverse. The majority of these actions would occur in a developed area, largely within the footprint of existing development. However, the increase in parking availability would likely increase visitor-related noise in the vicinity of the parking lot. As such, the long-term impact on the soundscape environment would be local, minor, and adverse.

Camp 4 and Yosemite Lodge. The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 300 automobiles and 15 tour busses. The latter actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. The majority of these actions would occur in close proximity to existing development. As such, the long-term impact on the soundscape environment would be local, minor, and adverse.

Segment 2 Impact Summary: Actions to protect and enhance river values within Segment 2 would have short-term, minor to moderate, adverse impacts on the soundscape environment, but would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on the soundscape environment.

Segments 3 and 4: Merced River Gorge and El Portal

Impacts of Actions to Protect and Enhance River Values

Proposed actions to protect and restore areas around valley oaks in Segment 4, such as the demolition and removal of Odgers bulk fueling facility, would require the use of heavy equipment which would result in short-term, moderate, adverse impacts on Segment 4 soundscapes in the project vicinity.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Management actions to address facilities under Alternative 6, specifically new employee housing development, would temporarily increase noise from construction activity and project vehicles on nearby roadways. Heavy construction equipment and haul trucks would temporarily add to the noise environment in the project vicinity. Noise from demolition/construction work would be expected to have a short-term, moderate, adverse impact on noise-sensitive uses in the vicinity. The construction of new employee housing would contribute to increased noise associated with housing occupation in Rancheria Flatt and Abbeville. The expected impact on Segment 4 soundscapes would be long-term, minor, and adverse.

Segments 3 & 4 Impact Summary: Actions to protect and enhance river values within Segment 4 would have short-term, moderate, adverse impacts on soundscapes in the project vicinity, but would not be expected to have any long-term impacts. Actions to manage user capacities, land use, and facilities would have short- and long-term, minor, and adverse impacts on the soundscape environment within Segment 4.

Segments 5, 6, 7, and 8: South Fork Merced River, Wawona Impoundment, and Wawona

Impacts of Actions to Protect and Enhance River Values

Biological Resource Actions. Restoration activities, including relocation of two stock use campgrounds, would involve heavy equipment which would have a short-term, moderate, adverse impact in the vicinity of the action within Segment 7.

Impacts of Actions to Manage User Capacity, Land Use, and Facilities

Elimination of the concessioner stable operations and day rides, and changes to visitor and administrative facilities, and various visitor access and transportation improvements in Segment 7 would require construction efforts that would result in short-term, minor to moderate, adverse impacts on soundscapes in the vicinity from construction noise. Reduced activity in the vicinity would contribute to a long-term, negligible, beneficial impact.

Wawona Campground. Under Alternative 6, the park would reduce the size of the Wawona Campground. Thirteen campsites, or 13% of all campsites within Wawona, would be removed from the floodplain. Equipment required to remove these facilities would have short-term, moderate, adverse impacts on area soundscapes. However, the removal of campsites would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact on the soundscape.

Segments 5-8 Impact Summary: Actions to protect and enhance river values within Segment 7 would result in local, long-term, minor, beneficial impacts. Actions to manage user capacity, land use, and facilities would reduce n long-term noise exposure, contributing to local, negligible, beneficial impacts on the soundscape environment.

Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration

The acoustical environment in Yosemite Wilderness would not be affected by actions associated with Alternative 6, but would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in nonwilderness areas would continue to be shaped primarily by noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Care should be taken to assess potential noise production from future uses. Temporary noise from restoration and construction operations would add to the noise environment, producing short-term, moderate, adverse noise impacts in construction areas. The construction of new facilities, namely housing and campgrounds, and parking lots would produce long-term, minor, noise impacts in the vicinity of such facilities. Increased visitation would similarly increase noise throughout Yosemite Valley. Overall, with implementation of mitigation measures MM-NOI-1 through MM-NOI-3, as applicable (see Appendix C), noise would be increased relative to Alternative 1, resulting in a long-term, minor, adverse impact on soundscapes in the Merced River corridor.

Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration

The discussion of cumulative impacts on soundscapes is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of the actions common to Alternatives 2–6. The cumulatively considerable projects would be the same as those identified for Alternative 1, above, and include only those that could affect noise in the Merced River corridor or could be affected by noise sources in the corridor.

Overall Cumulative Impact

Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts, primarily in non-wilderness areas. Increased visitation, in combination with new facilities construction and operation, such as employee housing, would contribute to long-term, minor, adverse noise impacts to soundscapes in the vicinity of these facilities.

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