Appendix F: Draft Statement of Findings for Protection of Wetlands

Appendix F
Draft Statement of Findings for Protection of Wetlands
(Executive Order 11990)

Restoration of the Mariposa Grove of Giant Sequoias

Recommended

Don L. Neubacher, Superintendent, Yosemite National Park Date

Certified for Technical Accuracy and Servicewide Consistency

Forrest Harvey, Chief, National Park Service Water Resources Division Date

Approved

Christine S. Lehnertz, Pacific West Regional Director Date

INTRODUCTION

The National Park Service (NPS) prepared the Restoration of the Mariposa Grove of Giant Sequoias Final Environmental Impact Statement (*Final Mariposa Grove/ EIS*) to restore habitat and natural processes critical to the long-term health of the Mariposa Grove ecosystem, including the giant sequoia trees, wetlands, and associated plant and wildlife communities. Additional goals of the project are to conserve and protect cultural resources and improve the overall experience for visitors to Mariposa Grove. This Wetland Statement of Findings is a required component of the Record of Decision for an environmental impact statement, per NPS Director's Order #77-1: Wetland Protection, which establishes the policies, requirements, and standards for implementing Executive Order 11990 (Protection of Wetlands). A separately identifiable Wetland Statement of Finding is required when an alternative selected for implementation would result in adverse impacts on wetlands. This Statement of Findings:

- Presents the rational for implementation of the proposed project with regard to wetlands, and documents the anticipated effects on wetland resources
- Describes the effects on wetland values associated with the proposed action
- Provides a thorough description of mitigation measures
- Ensures "no net loss" of wetland functions or values

THE PURPOSE AND NEED FOR ACTION

The Mariposa Grove of Giant Sequoias (figure F-1) is one of the most significant natural and cultural resources in Yosemite National Park. The primary purpose of the proposed project is to restore degraded habitat and natural processes critical to the long-term health of the giant sequoias, wetlands, and associated plant and wildlife communities in the Mariposa Grove; conserve and protect cultural resources; and improve the overall experience for visitors to Mariposa Grove. The following existing conditions have a negative effect on the ecological health and historic context of the Mariposa Grove:

- Road, trails, and other infrastructure are disrupting the natural hydrologic functioning of the Mariposa Grove
- Buildings and infrastructure are encroaching on individual giant sequoias and their roots, and reduce habitat for giant sequoia propagation
- Ongoing foot and vehicle traffic throughout the Mariposa Grove is damaging giant sequoia trunks, compacting soils, and exposing shallow giant sequoia roots, potentially making the trees less resilient and more susceptible to external stressors
- The risk of catastrophic fire remains high due to heavy fuel loading

In addition, current conditions diminish the quality of the visitor experience including:

- The road configuration at the South entrance to Yosemite is confusing and highly congested during periods of high use, creating safety concerns
- Frequent closures of the parking lot and road to the Mariposa Grove contribute to visitor frustration
- Shuttles from Wawona are often full, limiting boarding and increasing wait times for visitors

- Way-finding is in need of improvement
- Trails and other infrastructure do not meet accessibility requirements
- Vault toilets are inadequate and not fully accessible, and are the source of nuisance odors
- Operation of the commercial tram throughout the Mariposa Grove creates vehicle/pedestrian conflicts and affects natural soundscapes throughout the Grove
- Historic features at Wawona Point are in disrepair

WETLANDS IN THE MARIPOSA GROVE AREA

Though the Mariposa Grove of Giant Sequoias occupies a small part of Yosemite National Park (less than 900 acres), the Mariposa Grove has exceptional ecological importance. Wetlands in the Grove form an almost continuous, dendritic network making up a significant portion (12.3%) of the Grove's watershed (figure F-2). Wetlands in the Grove provide important hydrologic support for the Merced River watershed and provide hydrologic functions including aquifer recharge, storm runoff abatement, sediment retention, prevention of erosion through streambank stabilization, and stream/river temperature moderation.

The Mariposa Grove encompasses a great diversity of habitats, plants, and wildlife. The area includes a rich mosaic of old growth mixed conifer forest (with trees of all age classes, standing snags, and large downed trees), streams, wetlands, and a number of special status plant and wildlife species including the pacific fisher. The pacific fisher is a candidate for listing under the Federal Endangered Species Act and has a high likelihood of listing prior to project completion. Several fens, which have a limited distribution in the Sierra Nevada, are present. The location of the giant sequoias is strongly linked to the presence of wetlands. About 82% of giant sequoias are located within 200 feet of delineated wetlands (Kuhn 2011). This supports conclusions by Halpin (1995) on the importance of topographic flow accumulation, and further signifies the importance of soil water availability within the rooting zone for giant sequoia.

Wetland Extent

The NPS investigated and delineated wetlands in two areas: the Mariposa Grove (figure F-2), and near the park's South Entrance (figure F-3)[1]. Specific wetland classes identified within the project area consist of riverine wetlands (rivers, creeks, and streams) and palustrine wetlands (shallow ponds, marshes, swamps, and sloughs). The Mariposa Grove encompasses 90.3 acres of palustrine forested wetland, 1.6 acres of palustrine scrub shrub wetland, 8.8 acres of palustrine emergent wetland, and 2.0 acres of riverine (NPS 2011a). The surrounding mountain slopes are gentle and incised by approximately 6.1 miles of perennial and 2.8 miles of seasonal streams. Wetlands are continuous along the dendritic network of perennial (6.1 miles) and seasonal (2.8 miles) streams that drain the project area. In and near the South Entrance, 1.4 acres of palustrine forested wetland were delineated (NPS 2011a).

[1] A qualified wetland specialist with nine years' experience as a wetland ecologist, nine additional years of experience as a botanist and restoration ecologist, a M.S. in restoration ecology, a professional certificate in wetland ecology, and U.S. Army Corps of Engineers wetland delineator training conducted the wetland delineation.

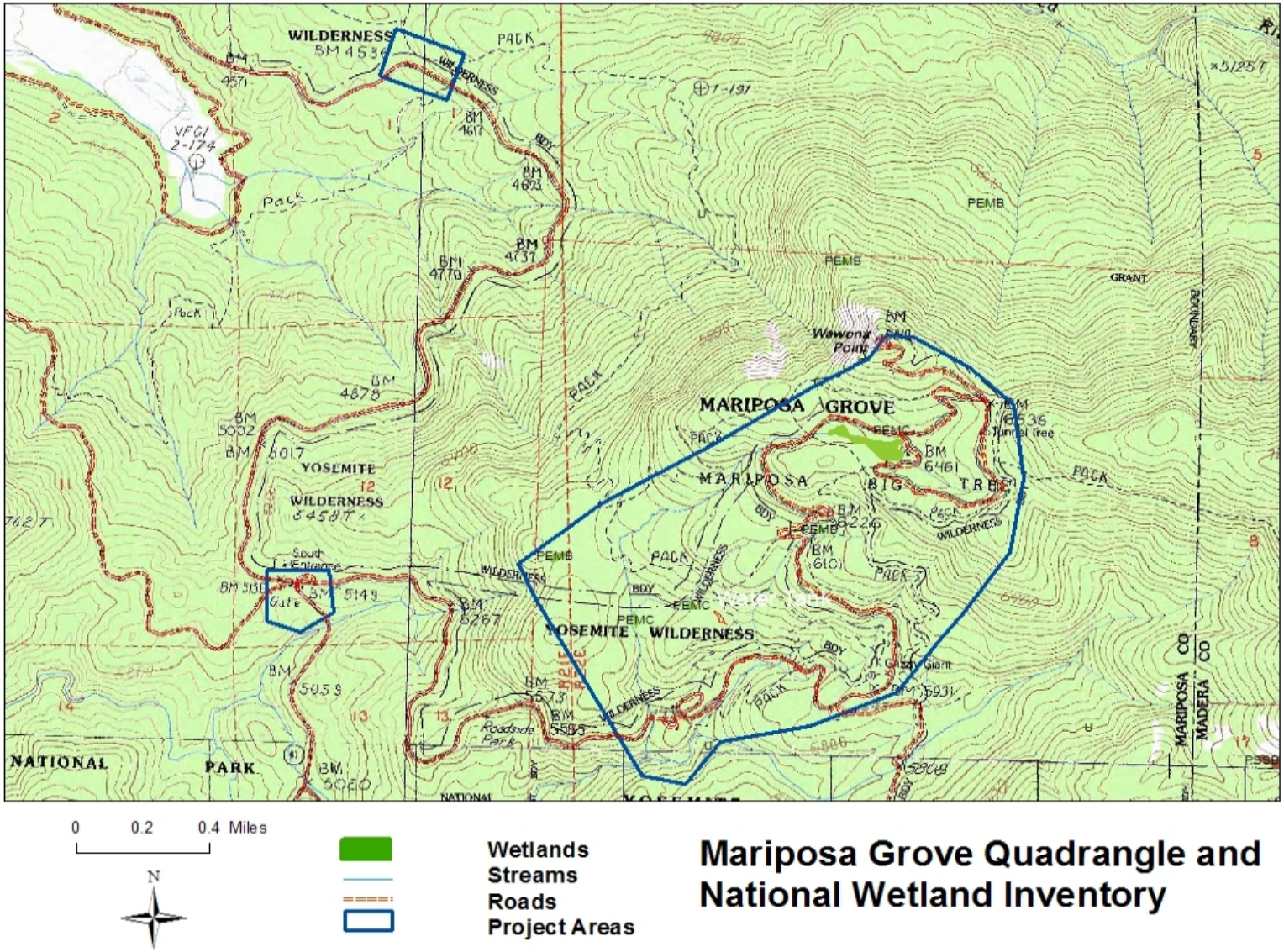

Figure F-1 – Mariposa Grove and South Entrance Vicinity Map (NPS 2011a)

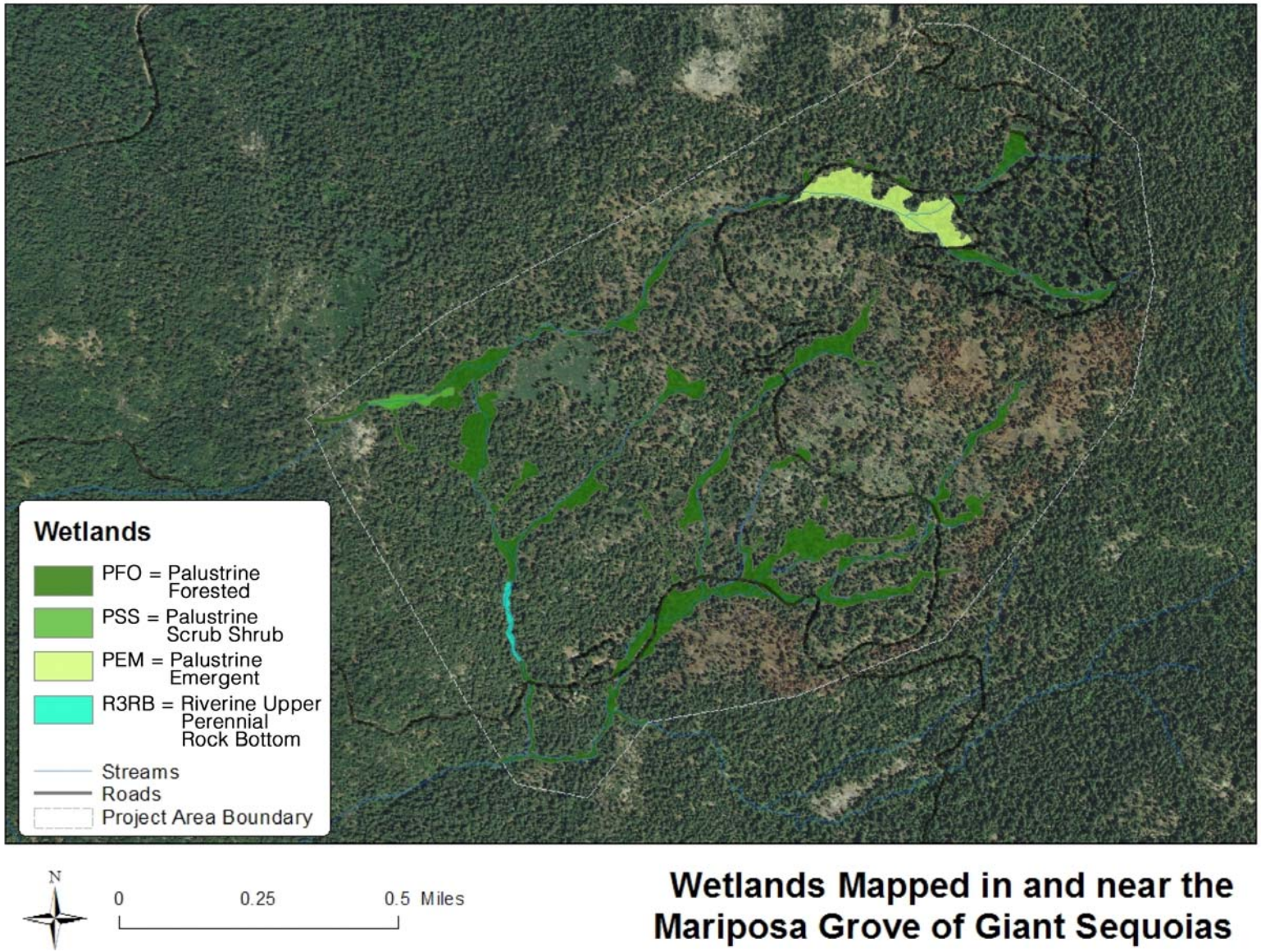

Figure F-2 – Wetlands in and near the Mariposa Grove of Giant Sequoias (NPS 2011a)

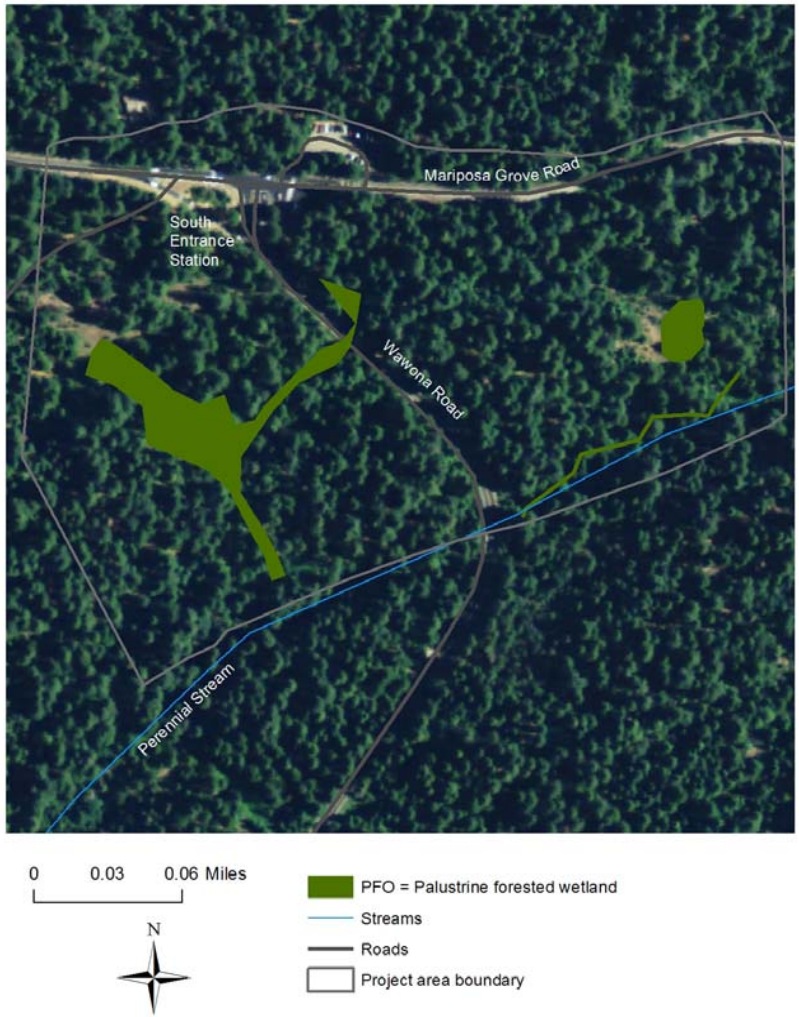

Figure F-3 – Wetlands at the South Entrance to Yosemite National Park (NPS 2011a)

Existing Structures in Wetlands

The Mariposa Grove Road crosses through delineated wetland in the lower Grove, at several areas as the road climbs toward the upper Grove, and in the upper Grove largely along the upper Grove loop. Roads, parking areas, trails, and visitor facilities are located near giant sequoias and within wetland and rare plant habitat throughout the project area. Infrastructure and visitor use may negatively affect wetland and stream hydrology and function, wetland and rare plant communities, and giant sequoias.

ALTERNATIVES CONSIDERED

To address the issues facing the Mariposa Grove and its visitors, and consistent with goals outlined in the 1980 *General Management Plan* for Yosemite National Park, the NPS developed a No Action Alternative and three action alternatives that include major actions to ecologically restore the Grove and improve visitor experience.

A number of proposed actions are common to the action alternatives including ecological restoration, infrastructure removal or improvement, and actions to improve the visitor experience. These common actions include road and trail and culvert repair to improve hydrologic flows; project-specific prescribed fire and hazardous fuel reduction treatments; removal of pavement and soil decompaction; repair/replacement of the leaking water distribution system; relocation of the water tank; and improvement of visitor orientation and accessibility. Rehabilitation, stabilization, protection, and/or enhanced interpretation of cultural resources at Mariposa Grove, Wawona Point, and South Entrance are also common to the action alternatives. Other components vary among the three action alternatives.

Alternative 1

Alternative 1, No Action, serves as a baseline from which to compare the other alternatives. Alternative 1 would continue the current level of maintenance and operations at the Mariposa Grove of Giant Sequoias. Infrastructure would remain concentrated in the lower part of the Grove and commercial operation of the tram and the gift shop would continue. Access to Mariposa Grove would remain challenging for visitors during peak use periods. Renovation, rehabilitation, or upgrading of existing facilities to improve functionality and accessibility would occur as emergency actions in response to system failures, rather than as planned and coordinated actions. The current level of interpretation and orientation would stay the same, and utilities and comfort stations would not be upgraded. Stressors on the giant sequoias, wildlife, special status species, and other natural and cultural resources in the Grove and at South Entrance would remain in place, and the visitor experience likely would continue to deteriorate as demand to access and experience the Grove increasingly exceeds the capacity of the current infrastructure to accommodate the number of day-use visitors.

Alternative 2

Alternative 2, South Entrance Hub (NPS Preferred Alternative), would remove the majority of visitor parking, commercial tram staging and operations, and the concessioner-operated gift shop from the Mariposa Grove to allow for comprehensive restoration of wetlands, soundscape, and giant sequoia habitat. Parking, shuttle facilities, and visitor services would be relocated to a South Entrance transit hub. Comfort stations would be renovated or replaced, and accessible trails would be established in the ecologically restored lower Grove area and at the iconic Grizzly Giant. The historic Washburn Trail from South Entrance would be extended as a pedestrian trail from its current terminus at the Mariposa Grove Road picnic area to the lower part of Mariposa Grove. The intersection of Mariposa

Grove Road and Wawona Road at South Entrance would be realigned, and a roundabout could replace the current T-intersection to improve traffic flow.

Under Alternative 2 (Preferred) there would be a net gain of 1.00-acre of wetlands in highly valued giant sequoia habitat. Overall, there would be a 3.98-acre reduction of developed areas in the Grove. The reduction in development would form a natural buffer around wetlands and improve overall hydrologic flows throughout the Grove. To achieve these objectives there would be 0.37-acre of permanent wetland loss, in lower value habitat. (Table F-1).

Between the Draft and the Final EIS, NPS evaluated changes to the layout to further minimize potential impacts near the South Entrance. Although changes to the parking configuration were made to reduce direct impacts, it is expected that there would still be indirect impacts on those wetland areas due to the new facilities at the South Entrance hub.

Alternative 3

Alternative 3, Grizzly Giant Hub, would relocate public parking and visitor services from the lower Grove areas to a location outside giant sequoia habitat in the vicinity of Grizzly Giant. This would include removing the lower Grove area parking lot, gift shop, and commercial tram staging area and operations to allow for comprehensive restoration of giant sequoia habitat, wetlands, and soundscapes. A new road segment with two bridges would be constructed to skirt the lower Grove, and the existing road to Grizzly Giant would be removed. Accessible trails would be constructed in the lower and mid-Grove areas, and comfort stations would be upgraded or replaced. The intersection at South Entrance would be reconstructed as a modified T-intersection to improve traffic flow. All toilets in the Grove would be vault toilets.

Under Alternative 3 there would be a net gain of 1.00-acre of wetlands in highly valued giant sequoia habitat. Overall, there would be a 5.75-acre reduction of developed areas in the Grove. The reduction in development would form a natural buffer around wetlands and improve overall hydrologic flows throughout the Grove. There would be little permanent wetland loss (<0.03-acre). To achieve this large area of restoration, a new road and pedestrian hub would be constructed (mostly outside of giant sequoia habitat). The new road would be constructed in prime fisher denning habitat, due to a lack of alternative locations (Table F-1).

Alternative 4

Alternative 4, South Entrance Hub with Modified Commercial Tram Service, would maintain the commercial tram operations for visitor access and enjoyment, but tram staging would be moved to a South Entrance Hub, similar to that described for Alternative 2, and the route and hours of operation would be reduced to provide a balance between visitor access and opportunities for quiet enjoyment and solitude in the upper part of the Grove. As under Alternative 2, the majority of public parking and visitor services would be relocated to the South Entrance. An accessible trail would be constructed through the lower Grove area, and an accessible overlook to the Grizzly Giant would be provided. The historic Washburn Trail from South Entrance would be extended to the Grove. The current T-intersection design of Mariposa Grove Road and Wawona Road at South Entrance would be retained.

Under Alternative 4, there would be a net gain of 0.77-acre of wetlands in highly valued giant sequoia habitat. Overall, there would be a 1.84-acre reduction of developed areas in the Grove. The reduction in development would form a natural buffer around wetlands and improve overall hydrologic flows throughout the Grove. To achieve these objectives there would be 0.37-acre of permanent wetland loss, mainly in lower value habitat (Table F-1).

Table F-1. Summary of Restoration, including Wetlands, by Alternative

	Alternative 1: No Action	Alternative 2: South Entrance Hub	Alternative 3: Grizzly Giant Hub	Alternative 4: South Entrance with Modified Commercial Tram Service
Wetland restoration	N/A			
Lower Grove restoration		0.85 acre	0.85 acre	0.75 acre
Road narrowing/Trail conversion		0.15 acre	0.15 acre	0.02 acre
TOTAL		1.00 acre	1.00 acre	0.77 acre
Wetland loss	N/A			
Water tank relocation (artificial wetland)		0.10 acre	0.00 acre	0.10 acre
South Entrance wetland		0.24 acre	0.00 acre	0.24 acre
Roadside wetlands (artificial wetlands)		0.02 acre	0.02 acre	0.02 acre
Piers associated with boardwalk		0.01 acre	0.01 acre	0.01 acre
TOTAL		0.37 acre	0.03 acre	0.37 acre
Net change in development project-wide[1]	N/A			
Net reduction of developed area within Grove		-3.98 acre	-5.75 acre	-1.84 acre
New development at South Entrance		+4.72 acre	0.00 acre	+4.72 acre
New development at Grizzly Giant and bypass road		0.00 acre	6.25 acre	0.00 acre
TOTAL		0.74 acre addition of developed area projectwide	0.50 acre addition of developed area projectwide	2.88 acre addition of developed area

[1] Excluding areas needed for new leach fields

Selection of the Preferred Alternative

Alternative 2 of the Final Mariposa Grove EIS best meets the goals and objectives of the project, which include protection and enhancement of wetland resources. Under Alternative 2, the NPS would move the existing parking area out of the core of the Mariposa Grove to a site near the South Entrance to Yosemite and restore a total of 1.0 acre of wetland. A shuttle would take visitors into the Grove to a drop-off site near the former parking area. Wetland impacts are unavoidable at the proposed site near the South Entrance. Essentially, Alternative 2 (Preferred) removes existing development from areas in the Mariposa Grove with high ecological value and moves parking to a site of lower ecological value. Alternative 3 would also enable 1.0-acre of wetland restoration in giant sequoia habitat, and result in no wetland impacts because a parking lot at the South Entrance would not be constructed. Under Alternative 3, a bypass road and parking area near the Grizzly Giant would be constructed. Under Alternative 3 there would be substantial impacts to pacific fisher habitat with creation of the new road and parking area. Overall, under Alternative 2 there would be 0.74-acre *addition* of developed areas in the project area. Under Alternative 3 there would be 0.50-acre *addition* of developed areas in the project area. Alternative 4 would avoid construction of the new road proposed under Alternative 3, but overall, there would be a net gain of 2.88 acres of new development.

Alternative 2 protects and enhances fisher habitat and has the lowest overall reduction of developed areas in the Grove. In addition, Alternative 2 best curtails vehicle traffic on the Mariposa Grove road and within the Grove, restores soundscapes by eliminating most private vehicle parking in the Grove, and discontinues operation of the fee-for-service commercial tram. All of these actions would best address visitor and operational services that are adversely affecting giant sequoia (e.g. impeded hydrology, soil compaction in root zones, bark removal and bole damage), and provide the best opportunity to sustain the Mariposa Grove for the enjoyment of future generations.

IMPACTS OF THE PROPOSED ACTION ON WETLANDS

Under Alternative 2 (Preferred), there would be a total of 0.37-acres of permanent loss of wetlands. Potential impacts would be associated with relocation of a water tank (0.1-acre), construction of a parking lot at the South Entrance (0.24-acre), reduction of artificial roadside wetlands that could dry up with road improvements (0.02-acre) , and installation of piers associated with boardwalk construction (0.01-acre).

Relocation of the water tank in the upper Mariposa Grove. Relocation of the water tank could dry up part of an artificial wetland associated with the tank overflow to prevent freezing (0.1- acre).

Parking area construction at the South Entrance. Construction of a parking area near the South Entrance would result in permanent impacts to a 0.24-acre palustrine emergent wetland (figure F-3 – the oval 0.24- acre wetland on the right side of the map). Figure F-4 provides a more detailed drawing of the area.

Wetland near the South Entrance (0.24 acre)

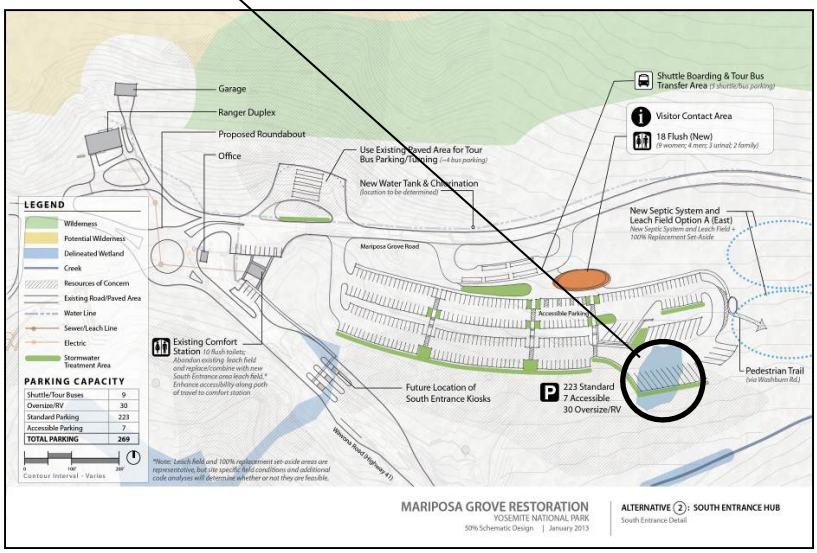

Figure F-4 – Wetland that would be permanently impacted at South Entrance (0.24-acre)

The forest surrounding the 0.24-acre wetland at the South Entrance was disturbed by past logging activities. The parking area would obliterate most of the wetland, and harden the area where water enters the wetland. The NPS assumes that and portions of the wetland not under asphalt would dry up and not function as wetland.

This wetland is dominated by grasses, sedges, and forbs, with scattered small trees and tree seedlings. Three of the six dominant vegetative species across all strata have a wetland indicator status assigned by the U.S. Fish and Wildlife Service. Ponderosa pine and Kentucky bluegrass (*Poa pratensis*) are rated "facultative upland" species, and the grass *Muhlenbergia richardsonia* is rated a "facultative" species. Three *Carex spp*., one *Juncus sp*., and one *Epilobium sp*. were dominant in places. While the NPS did not identify these five plants to the species-level because of the season, most species in these genera are found in wetlands at this elevation in Yosemite National Park. The other dominant species, incense cedar, white fir, and sticky cinquefoil (*Potentilla glandulosa*) are not rated. Kentucky bluegrass and incense cedar commonly grow in wetlands in the park. Overall, the vegetation was determined to be hydrophytic. Soils have a redox dark surface, with common mottles in a dark matrix.

Wetland hydrology was not present at the time of the site visit, which took place after the first rain and snow events following a historically dry winter and summer. The NPS assumed that hydrology is present to sustain the wetland, which forms an opening in an otherwise continuous forest. Wetland hydrology indicators included the geomorphic position at a terrace at the foot of a mountain slope and the presence of reduced iron in the soil. Wetland hydrology was found in adjacent areas with similar vegetation and soils during a wetland delineation conducted in late summer of the previous year.

While the site was disturbed in the past by logging, the position of this wetland as a forest opening could provide a small area of hunting habitat for owls. The wetland could provide browsing opportunities for deer and other herbivores, especially in late season, though additional browsing opportunities are common in the area.

Artificial roadside wetlands resulting from berms and failed culverts. Some roadside wetlands are likely to dry up once flows are restored to natural patterns (< 0.02 acre). These artificial wetlands were created on previously dry (upland) as a result of human activities and are low-value wetlands.

Piers associated with the construction of boardwalks. There would be a small loss of wetlands (< 0.01-acre) as a result of installation of small piers to extend the existing footbridge in the lower Grove to protect the wetland from trampling impacts and replacement of drainage culverts to accommodate larger flows. These actions are designed for the purpose of public enjoyment and education, and wetland protection.

There would also be site-specific temporary impacts on wetlands during the construction phase. All wetlands would be protected using best management practices (see Attachment A). The removal of impervious surfaces associated with existing buildings could temporarily increase groundwater infiltration by exposing soils. A temporary change in surface runoff during construction would not be noticeable in the Mariposa Grove and would have a minimal effect on function or value of the wetlands in the Mariposa Grove.

The repair of leaking water pipes could have small local impacts on water tables, as it would eliminate unintended leakage. It is difficult to quantify or locate site-specific underground leaks in this complex and large system, but overall, replacement of water lines could contribute to localized minor decreases in water levels leading to restoration of natural water levels.

Beneficial wetland impacts. There would be 1.00-acre of wetland habitat gain due to ecological restoration activities in the lower Grove (figure F-5) and removal of trails and narrowing of roads in the upper Grove (figure F-6).

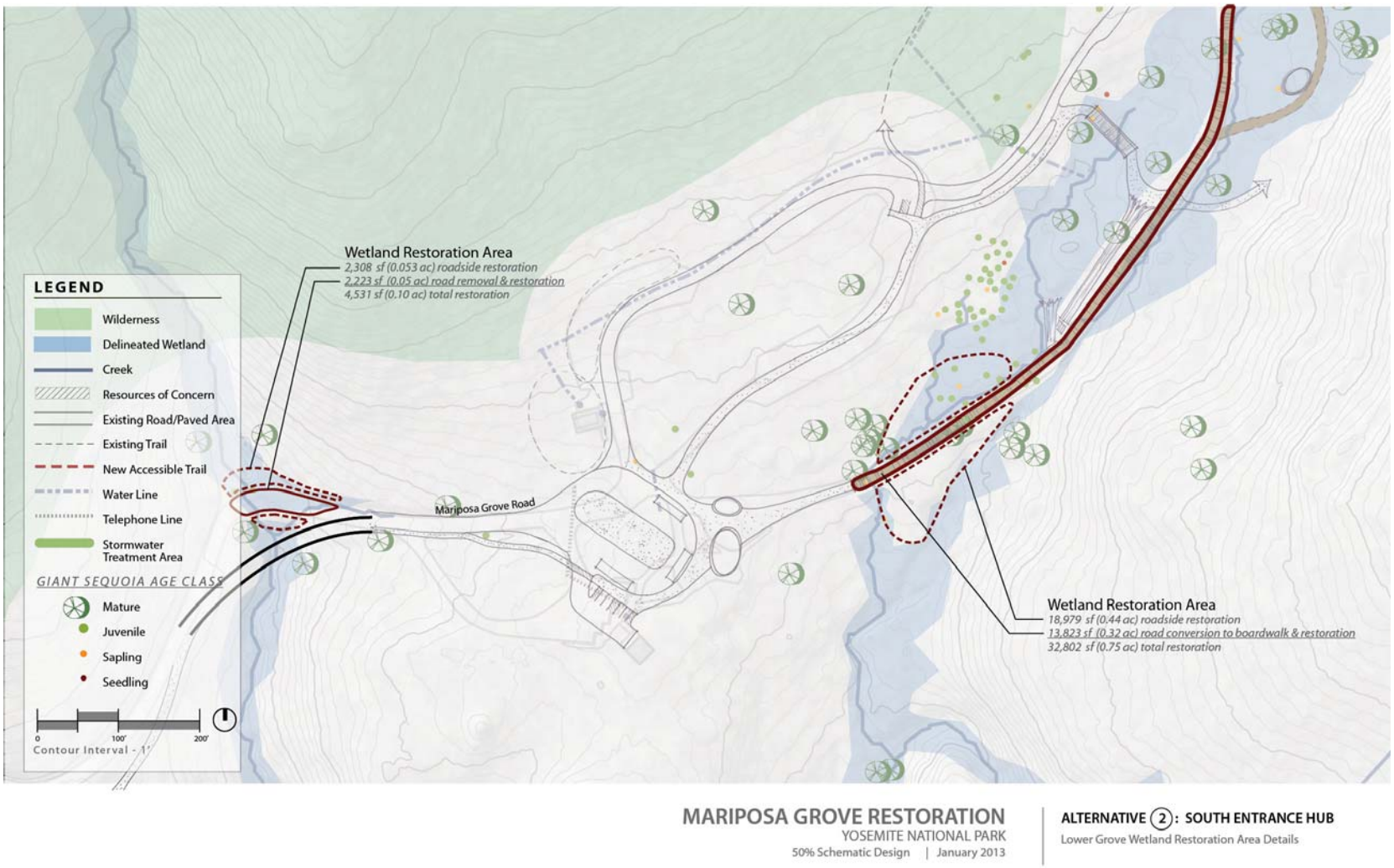

Figure F-5. Wetland Restoration proposed in the lower Grove under Alternative 2 (Preferred) (0.85-acre)

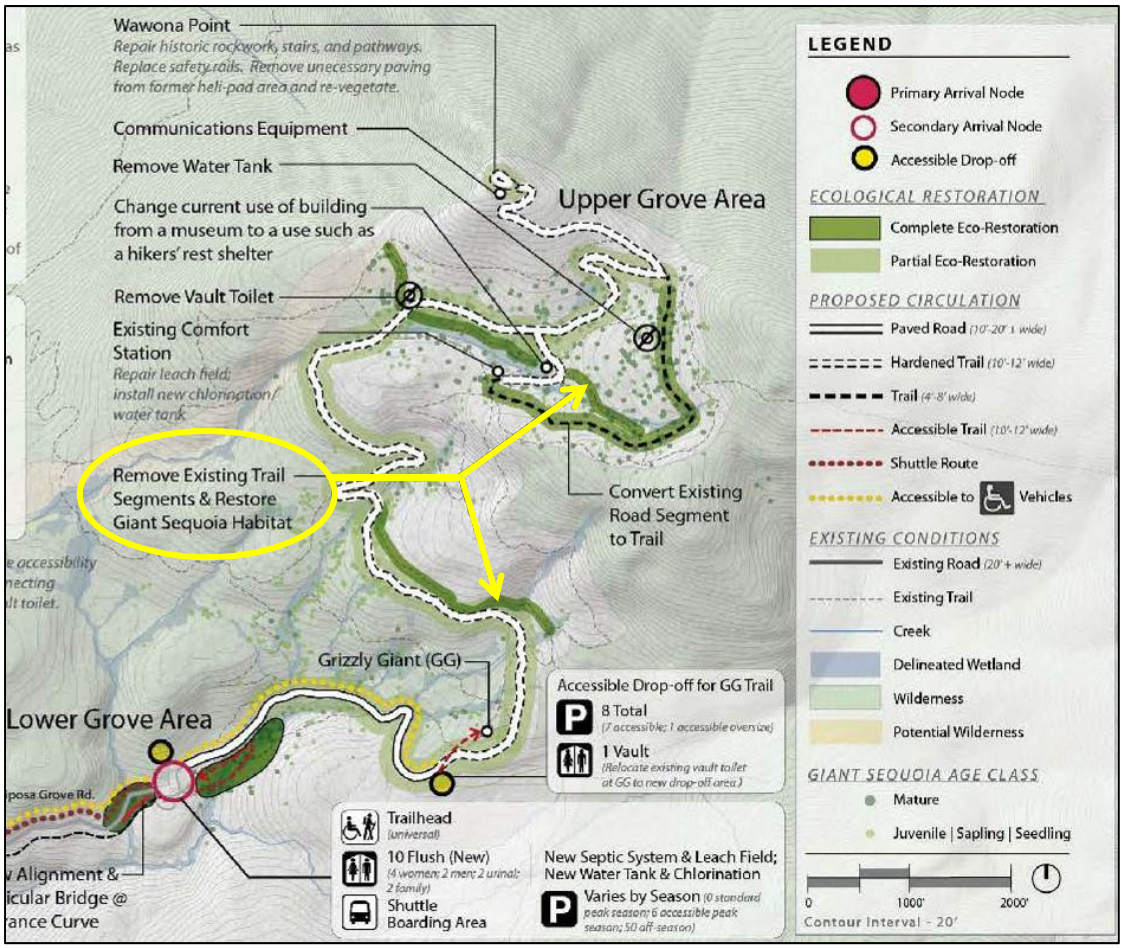

Figure F-6. Wetland restoration proposed in the upper Grove under Alternative 2 (Preferred) (Trail removal and road narrowing would restore 0.15-acre of wetland habitat)

Additionally, infrastructure and development would be removed from the Grove and subsequent ecological restoration would take place in natural areas outside of wetlands (3.93 acres, including wetland restoration). The principal values of this large wetland complex include important hydrologic support for the Mariposa Grove such as aquifer recharge, storm runoff abatement, sediment retention, prevention of erosion through streambank stabilization, and stream/river temperature moderation. Wetlands in this area are likely thousands of years old, and they encompass a great diversity of habitats, plants, and wildlife. The area supports quality habitat for the pacific fisher, a candidate for listing under the Federal Endangered Species Act with a high likelihood of being listed prior to project completion. Prime denning habitat for the fisher includes and snags, multiple canopy layers, and few openings, conditions all found in the Mariposa Grove and confirmed by the presence of a nearby fisher den. The area supports a range of wetland types including several fens, which have a limited distribution in the Sierra Nevada. About 82% of giant sequoias in the Mariposa Grove are located within 200 feet of delineated wetlands (Kuhn 2011).

There would be substantial positive impacts to overall wetland functions in the Mariposa Grove. For example, removal of impermeable surfaces such as asphalt roads and trails would create natural buffers around existing and restored wetlands. Hydrologic connectivity (surface flow and shallow groundwater) would be restored by cleaning, repairing, and replacing dysfunctional culverts and

outsloping road trail surfaces. The watershed would be restored to a more natural configuration, infiltration in the Grove would increase, and stormwater runoff would decrease, resulting in beneficial impacts on surface water quality. Leaky water pipes in the upper Grove would be repaired and monitored. Repair of septic systems and leach fields would reduce the potential to introduce nutrients to shallow groundwater.

In the long term, removal of facilities and elimination of associated uses such as commercial tram service from the Mariposa Grove would protect and restore wetland habitat. Realignment of the Grove road northward out of the delineated wetland, and conversion of the original alignment to an accessible trail, would beneficially impact wetlands in that portion of the Grove. Closing the existing road in the Mariposa Grove would reduce operation activities and reduce the potential for inadvertent impacts on wetlands from trampling, although some recreational foot traffic in nearby wetlands would continue. Discharge of waterborne pollutants directly into wetland communities from road and parking areas would be reduced in the Mariposa Grove, but would increase at the South Entrance.

Cumulative Impacts

Cumulative effects to wetlands are based on analysis of past, present, and reasonably foreseeable future actions within the project area in combination with the potential effects of the proposed actions. Past, present, and reasonably foreseeable future actions affecting wetlands include implementation of the park's Merced Wild and Scenic River Comprehensive Management Plan, Merced River Ecological Restoration at Eagle Creek Project, Wawona Meadow Restoration, South Entrance Kiosk project, and fuel reduction projects on adjacent Forest Service land.

The South Entrance Kiosk project (Categorical Exclusion 39501) is of particular importance, as it takes place directly adjacent to the Mariposa Grove project, and wetland impacts associated with the kiosk project will be compensated as part of the Mariposa Grove project. The U.S. Army Corps of Engineers authorization for the kiosk replacement project under Section 404 of the Federal Clean Water Act requires the NPS to create 0.6 acre of similar wetlands as part of the Mariposa Grove project to mitigate impacts under the South Entrance Kiosk project (see Compensatory Mitigation Section).

Alternative 1 (No Action), in conjunction with past and future actions, would continue to contribute to adverse cumulative impacts on wetlands due to existing infrastructure in the lower Grove wetlands, continued diversion of water within the Grove, and existing erosion and channelization and resultant sedimentation. Alternatives 2, 3, and 4 in conjunction with past and future actions may contribute to temporary negligible or minor local adverse impacts to wetlands; however, there would be long-term major cumulative beneficial impacts from wetland habitat restoration.

COMPENSATORY MITIGATION

Ecological restoration within the Mariposa Grove will include restoration of 1.00-acre of wetland restoration (figures F-5 and F-6). Following construction activities, artificial fill material will be removed with excavator and skid steer and the area will be revegetated with appropriate wetland, riparian and upland native plant species. Ground surface treatment will include decompaction, salvaging top soil, seeding, and planting. Accepted erosion protection measures, including jute mesh and hydro mulch, may be used, if necessary, to prevent soil loss. The NPS will prepare a prescription for revegetating disturbed areas including riverbanks in construction specifications. This prescription would comply with the Yosemite *Vegetation Management Plan* (NPS 1997) and the *Invasive Plant Management Plan* (2008) and the *Invasive Plant Management Plan Update* (2011b). Revegetation of disturbed sites would be conducted by park staff immediately following

construction to reduce the potential for non-native plant invasion. All plant materials will be from genetic stock indigenous to Yosemite National Park, including trees, shrubs, and forbs salvaged from the construction site or by propagating container plants from seed or cuttings. Following restoration efforts, revegetated sites will be monitored to determine if revegetation efforts were successful and if additional remedial actions are necessary. Remedial actions could include the installation of erosion control structures, reseeding, and/or replanting the area, and controlling non-native plant species.

Avoidance of wetlands and adherence to mitigation measures described in the *Draft Mariposa Grove EIS* would minimize short-term impacts (see below). Construction equipment staging areas would not be located adjacent to or within wetlands. Implementation of construction Best Management Practices would be employed to minimize impacts associated with erosion and sedimentation (see Attachment A). Best Management Practices would include, but not be limited to, installation of silt fencing and sediment traps, application of water sprays to keep soil from becoming airborne, and revegetation of disturbed areas as soon as possible, where appropriate. Alternative 2 (Preferred) would have a long-term major beneficial impacts on wetlands from the removal of facilities, decreases in vehicular traffic, and the restoration of natural surface and subsurface water flows throughout the Grove.

Compensation

There would be 0.37-acre of wetland habitat compensation required under Alternative 2 (Preferred) of the Mariposa Grove project. Wetland impacts would be associated with:

- Relocation of a water tank (0.1-acre)
- Construction of a parking lot at the South Entrance (0.24-acre)
- Artificial roadside wetlands that could dry up with road improvements (0.02-acre)
- Piers associated with boardwalk construction (0.01-acre)

The compensation for wetland impacts from the Mariposa Grove project can be accommodated within the one acre of wetland restoration in the Mariposa Grove illustrated in figure F-5 and figure F-6. In addition, the NPS intends to count 0.6 acre of wetland restoration (out of the remaining 0.63-acre of wetland restoration in the Mariposa Grove) as mitigation specified required under a previous project, the South Entrance Station Kiosk Replacement project (Categorical Exclusion 39501).

The U.S. Army Corps of Engineers authorization for the kiosk replacement project under Section 404 of the Federal Clean Water Act specifically notes:

> *In order to properly mitigate for the impacts to waters of the United States with the creation of this* [kiosk replacement] *project you shall create 0.6 acres of similar wetlands as part of the adjacent Mariposa Grove wetland restoration project by September 30, 2015. These 0.6 acres of wetlands shall be monitored for five years or until it is determined to be a success by our office having at least 75% absolute coverage of dominate by native vegetation. For this site to be considered successful it must function as a wetland on its own at full vegetative coverage for three consecutive years without human intervention.*[Letter dated August 22, 2012 from the U.S. Army Corps of Engineers Regulatory Division to Supt. Don Neubacher, Yosemite National Park (SPK-2012-00685)

The Mariposa Grove project (Alternative 2) and the South Entrance kiosk replacement project comprehensively require a total of 0.97 acre of wetland compensation. Wetland compensation will be accommodated within the 1.00 acre of wetland restoration within Mariposa Grove illustrated in figure F-5 and figure F-6.

WETLAND IMPACT ANALYSIS AND FUNCTIONAL ASSESSMENT

Wetland impacts under Alternative 2 (Preferred) of the Draft Mariposa Grove EIS would take place near the South Entrance to Yosemite National Park. This is also the location of the wetlands that would be impacted as part of the South Entrance Station Kiosk Replacement project (Categorical Exclusion 39501), which requires compensation under the Mariposa Grove project (see Compensation section above). Potential impacts would take place in palustrine emergent wetlands in a portion of the park that was logged prior to designation as part of a national park. The 0.24 acre wetland to be impacted near the proposed parking lot could provide a small area of hunting habitat for owls. The wetland could provide browsing opportunities for deer and other herbivores, especially in late season. Alternative browsing opportunities are common in the area.

Wetlands that would be restored would enhance a portion of a large, complex, very high-value wetland that encompasses 90.3 acres of palustrine forested wetland, 1.6 acres of palustrine scrub shrub wetland, 8.8 acres of palustrine emergent wetland, and 2.0 acres of riverine wetland. The restored 1.00-acre wetland would be primarily palustrine emergent wetland, but it would be adjacent to the mix of additional wetland types. The principal values of this large wetland complex are hydrologic support for Mariposa Grove including aquifer recharge, storm runoff abatement, sediment retention, prevention of erosion through streambank stabilization, and stream/river temperature moderation. The area has never been logged. The Mariposa Grove supports quality habitat for the pacific fisher, a candidate for listing under the Federal Endangered Species Act with a high likelihood of listing prior to project completion. Prime denning habitat for the fisher includes snags, multiple canopy layers, and few openings, conditions found in the Mariposa Grove and confirmed by the presence of a nearby fisher den. The area supports a range of wetland types including several fens, which have a limited distribution in the Sierra Nevada. About 82% of giant sequoias in the Mariposa Grove are located within 200 feet of delineated wetlands (Kuhn 2011).

Overall there would be 0.37-acre of wetland impact in a wetland of low-moderate value and 1.00-acre of wetland restoration in a very high-value wetland. In addition to specific wetland restoration, there would be substantial positive impacts to overall wetland functions in the Mariposa Grove. About 3 acres of wetland buffer and surrounding habitat would be restored, in addition to direct wetland habitat gain. For example, removal of impermeable surfaces such as asphalt roads and trails would create natural buffers around existing and restored wetlands. Hydrologic connectivity (surface flow and shallow groundwater) would be restored by cleaning, repairing, and replacing dysfunctional culverts and outsloping road and trail surfaces. Overall, there would be a long-term, major beneficial impact on wetlands as a result of Alternative 2 (Preferred) in the Draft Mariposa Grove EIS.

COMPLIANCE

This document is required in order to comply with the National Park Service's Director's Order #77-1: Wetland Protection. Compliance with other agency regulations will be completed (if appropriate for this project) separately from this document. Separate compliance with other appropriate federal laws and regulations is required per NPS Director's Order #77-1: Wetland Protection and Procedural Manual. For example, NPS activities that involve the discharge of dredged or fill material into wetlands or other waters of the United States may have to comply with Sections 401 and 404 of the Clean Water act and Section 10 of the Rivers and Harbors Act. And if

appropriate, the NPS may also have to comply with the Fish and Wildlife Coordination Act; the Endangered Species Act; the National Historic Preservation Act; and other relevant laws and regulations governing actions in wetlands and other aquatic environments.

CONCLUSION

Alternative 2 will restore 1.00-acre of wetlands in the Mariposa Grove. Construction activities would result in adverse impacts on 0.37- acre of wetlands. The 0.37- acre of wetlands lost will be compensated with the ecological restoration of 1.00-acre of high-value wetlands to be restored in the core of the Mariposa Grove. The remaining 0.63-acre of wetland restored in the Grove will serve as compensation for 0.6-acre of impact to wetlands created by a separate project, already approved and in progress, which involves filling 0.6-acre of wetland for the construction of kiosks near the south entrance.

Individual permits with other federal and cooperating state and local agencies, for example under Clean Water Act Section 404 or 401, will be obtained or updated as appropriate prior to restoration or construction activities. There would be no change to the natural and cultural integrity of the park, or discernable effects to resource values identified in the 1980 Yosemite National Park *General Management Plan* (NPS 1980). The NPS finds the proposed action to be consistent with the policies and procedures of under Executive Order 11990 for the protection of wetlands and NPS Director's Order #77-1: Wetland Protection, including the "no-net-loss of wetlands" policy.

REFERENCES

Central Valley Regional Water Quality Control Board (CVRWQCB). 1983. *Guidelines for Protection of Water Quality During Construction and Operation of Small Hydro Projects*.

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ATTACHMENT A
BEST MANAGEMENT PRACTICES AND RESOURCE-SPECIFIC MITIGATION MEASURES

Best Management Practices and resource-specific mitigation measures would be implemented, as appropriate, prior to, during, and/or after construction.

Best Management Practices During Construction Activities

The NPS (and its contractors) would implement the following Best Management Practices, as appropriate, prior to, during, and/or after construction activities. Specific tasks would include, but are not limited to, the following:

- Prior to entry into the park, steam-clean heavy equipment to prevent importation of non-native plant species, tighten hydraulic fittings, ensure hydraulic hoses are in good condition and replace if damaged, and repair all petroleum leaks. Implement compliance monitoring to ensure the project remains within the parameters of National Environmental Policy Act and National Historic Preservation Act compliance documents, USACE Section 404 permits, etc. Compliance monitoring would ensure adherence to mitigation measures and would include reporting protocols.
- Inspect the project to ensure that impacts stay within the parameters of the project area and do not escalate beyond the scope of the environmental assessment, as well as to ensure that the project conforms with all applicable permits or project conditions. Store all construction equipment within the delineated work limits. Confine work areas within creek channels to the smallest area necessary.
- Provide a project orientation for all construction workers to increase their understanding and sensitivity to the challenges of the special environment in which they will be working. Ensure equipment allowed within the river channel is equipped with a hazardous spill containment kit. Ensure that personnel trained in the use of hazardous spill containment kits are on site at all times during construction activities.
- A Storm Water Pollution Prevention Plan (SWPPP) shall be prepared by the construction contractor and implemented for construction activities to control surface run-off, reduce erosion, and prevent sedimentation from entering water bodies during construction. The SWPPP shall be submitted for park review and approval prior to construction. Store all construction equipment within the delineated work limits.
- Supervisory construction personnel shall attend an Environmental Protection briefing provided by the park prior to working on site. This briefing is designed to familiarize workers with statutory and contractual environmental requirements and the recognition of and protection measures for archeological sites, sensitive habitats, water resources, and wildlife habitats. The park shall develop a Communications Strategy Plan to alert necessary NPS and concessioner employees, residents, and visitors to pertinent elements of the construction work schedule.
- Develop an emergency notification plan that complies with park, federal, and state requirements and allows contractors to properly notify park, federal, and/or state personnel in the event of an emergency during construction activities. This plan will address notification requirements related to fire, personnel, and/or visitor injury, releases of spilled material, evacuation processes, etc. The emergency notification plan will be submitted to the park for review/approval prior to commencement of construction activities.

- Notify utilities prior to construction activities. Identify locations of existing utilities prior to removal activity to prevent damage to utilities. The Underground Services Alert and NPS maintenance staff will be informed 72 hours prior to any ground disturbance. Construction-related activities will not proceed until the process of locating existing utilities is completed (water, wastewater, electric, communications, and telephone lines). An emergency response plan will be required of the contractor.
- Avoid damage to natural surroundings in and around the work limits. Provide temporary barriers to protect existing trees, plants, and root zones, if necessary, as determined by vegetation management staff. Trees and other vegetation shall not be removed, injured, or destroyed without prior written approval. Ropes, cables, or fencing shall not be fastened to trees. All existing resource protection fencing (post and rope) shall be left in place and protected from heavy equipment.
- Remove all tools, equipment, barricades, signs, surplus materials, and rubbish from the project work limits upon project completion. Repair any asphalt surfaces that are damaged due to work on the project to original condition. Remove all debris from the project site, including all visible concrete, timber, and metal pieces. Grade disturbed areas and rake them smooth to eliminate tire tracks and tripping hazards.
- Locate, contain, and stabilize excavated and stored materials within upland staging areas and prevent re-entry into wetland or aquatic habitats.
- Use approved siltation and sediment control devices appropriate to the situation in grading areas to capture eroding soil before discharge to riparian channels.
- Delineate wetlands and apply protection measures during construction. Wetlands shall be delineated by qualified NPS staff or certified wetland specialists and clearly marked prior to work. Perform activities in a cautious manner to prevent damage caused by equipment, erosion, siltation, etc.

Resource-Specific Mitigation Measures

Hydrology and Water Quality

Prepare an erosion control plan specifying measures to prevent erosion/sedimentation problems during project construction. Include a map of the project site delineating where erosion control measures will be applied. Include the following minimum criteria, adapted from the *Guidelines for Protection of Water Quality During Construction and Operation of Small Hydro Projects* (CVRWQCB 1983):

- Where working areas are adjacent to or encroach on live streams, barriers shall be constructed that are adequate to prevent the discharge of turbid water in excess of specified limits.
- Material from construction work shall not be deposited where it could be eroded and carried to the stream by surface runoff or high stream flows.
- All disturbed soil and fill slopes shall be stabilized in an appropriate manner.
- Surface drainage facilities shall be designed to transport runoff in a non-erosive manner.
- Wastewater contaminated with by-products from construction activities shall be contained in a holding or settling tank to prevent contaminated material from entering watercourses or wetlands.

- Waters shall be free of changes in turbidity that cause a nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits, as described in *The Water Quality Control Plan* for the Central Valley Regional Water Quality Control Board (CVRWQCB 1998). In determining compliance with the limits below, appropriate averaging periods may be applied, provided that beneficial uses will be fully protected:
  - Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
  - Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20%.
  - Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
  - Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10%.
- Implement stormwater management measures to reduce nonpoint-source pollution discharge. This could include measures such as oil/sediment containment or street sweeping.
- Remove hazardous waste materials generated during implementation of the project from the project site immediately.
- Dispose of volatile wastes and oils in approved containers for removal from the project site to avoid contamination of soils, drainages, and watercourses. Keep absorbent pads, booms, and other materials onsite during projects that use heavy equipment to contain oil, hydraulic fluid, solvents, and hazardous materials spills.
- Final design and installation of site drainage improvements will be closely coordinated with the park's Resources Management and Science Division.
- Salvage hydric soils and use them as fill in wetland excavations to the maximum extent possible. Minimize use of fill materials with high permeability in wetland areas to prevent development of unnatural groundwater conduits.
- Incorporate trench plugs into new and abandoned utility corridors through wetland areas where required to prevent formation or continuation of groundwater conduits.

Vegetation

- The contractor will develop a Revegetation Plan in conjunction with the park's Resources Management and Science Division, to be approved prior to construction activities.
- Ensure that all earth-moving equipment and hand tools enter the park free of mud or seed-bearing material to prevent the introduction of non-native plants. The NPS will inspect all equipment prior to use on the project.
- Map and treat noxious weeds prior to construction. Certify all seeds and straw material as weed-free. Ensure that imported top-soil is weed-free. The NPS will approve sources of imported fill material that will be used within the top 12 inches of the finished grade. Monitor and treat invasive plants for three years post-construction.
- Install temporary fencing (black silt fencing or orange construction fencing) around the entire project area to protect natural surroundings (including sensitive plants, trees, and root zones) from damage. Avoid fastening ropes, cables, or fences to trees.

- Use native seed mix or seed-free mulch to minimize surface erosion and the introduction of noxious weeds.
- If special-status plant species are identified within the construction disturbance zone, in particular within restoration and revegetation areas, avoid special-status plant populations during construction activities. If the project manager is unable to avoid adverse impacts to rare plants, immediately contact the Park Botanist prior to work. Adverse impacts to the Yosemite bog orchid, in particular, are not acceptable. The Park Botanist will work with the project manager to mitigate unavoidable impacts to other special-status plants in the vicinity.
- If it is not feasible for construction activities to avoid special-status plant species (with the exception of the Yosemite bog orchid, which must be avoided), species conservation measures will be developed in coordination with Yosemite National Park natural resources staff. Measures may include salvage of special-status plants for use in revegetating disturbed areas and transplantation of special-status plants wherever possible using methods and monitoring identified in the revegetation plan, monitoring to ensure successful revegetation, protection of plantings, and replacement of unsuccessful plant materials if practicable.
- Provide proper and timely maintenance for vehicles and equipment used during construction to reduce the potential for mechanical breakdowns.
- Use silt fencing at drainages to prevent construction materials from escaping work areas.

Wildlife

Based on available anecdotal and scientific evidence, 78 amphibian, reptile, mammal, and bird species occur in the Mariposa Grove and South Entrance project area. Of these 78 species, 17 are special status species, including 10 bird species (northern goshawk, golden eagle, peregrine falcon, bald eagle, long-eared owl, great gray owl, California spotted owl, Vaux's swift, olive-sided flycatcher, and yellow warbler) and 7 mammal species (pallid bat, Townsend's big-eared bat, spotted bat, western red bat, western mastiff bat, Sierra Nevada mountain beaver, and Pacific fisher).

Mitigation to Protect Key Habitat Features for Fishers, Bats, And Owls

- Schedule construction activities with seasonal consideration of wildlife lifecycles to minimize impacts during sensitive periods (i.e., after bird nesting seasons, when bats are neither hibernating nor have young, etc.
- Limit the effects of light and noise on adjacent habitat through controls on construction equipment.
- In construction zones, conduct owl and bird surveys and bat acoustic surveys and install carnivore cameras as needed to inform proper mitigation actions that would reduce impacts on wildlife.
- Avoid disturbing basal hollows (created by repeated fires), deep bark furrows, and cavities and crevices of tree crowns important for bats and other wildlife (Pierson et al. 2006).

Snags are an essential habitat element for the majority of special status species documented using the Mariposa Grove. Removal of snags may indirectly result in decreased rates of reproduction and increased rates of mortality for fishers (USDA Forest Service 2001), and spotted owls use cavities in snags for nesting and raising young. If hazard tree (snag) removal cannot be avoided:

- Remove snags only under consultation with the park biologist and park forester.
- A wildlife biologist should examine any trees and snags for nesting, denning, or roosting wildlife, or the potential for such use, prior to removal.

Mitigation to Protect Fisher Dens

Protect all known fisher natal (birthing) and maternal (kit rearing) den structures within Yosemite, and any den structures located in the future. This measure is particularly compelling because female fishers have been known to reuse past dens (i.e. same fisher returning to the same den the next season or another female using a den occupied by a different fisher from a previous season) (R. Sweitzer, pers. comm.).

- Protect verified fisher birthing and kit rearing dens from March 1 - June 30 with 700-acre buffers consisting of the highest quality habitat (CWHR size 4 or greater and canopy closure greater than 60%) in a compact arrangement surrounding the den site in the largest, most contiguous blocks available.
- For active dens, within this buffer, (1) enforce a night closure of any paved roads and (2) halt construction, restoration, fire management, or other disturbing activities until the cessation of denning season (June 30).

Mitigation Specific to the Pacific fisher

- Continue monitoring fishers in the park (in conjunction with fisher researchers working in and around Yosemite National Park) to establish whether fishers are actively foraging or denning near the project area. Establish buffers to prevent disturbance around any active dens.
- Add wildlife crossing structures at riparian crossings near South Entrance and Mariposa Grove along Wawona and Mariposa Grove roads as construction work is being conducted.
- Conduct fuels reduction activities outside of fisher denning season.
- Time construction and restoration activities to avoid the most sensitive time periods for fishers (i.e. during denning season (March 1 - June 30) and during juvenile dispersal (from early February onward)
- Adaptively manage for fishers through continued targeted surveys during key time periods during construction/restoration/fire management activities.
- Retain habitat features important to fishers including: large diameter black oaks, large diameter conifers, large diameter snags, large decayed logs, high canopy closure/multiple layer canopy, and coarse woody debris on the ground, in areas with moderate to steep slopes and drainages with running and/or pooled water (Zielinski et al. 2004).
- Retain and recruit large-diameter (>11 inches diameter at breast height (DBH)) snags (Freel 1991; Buskirk and Powell 1994) and large-diameter (>24 inches DBH) live conifer and oak trees with decadence such as broken tops or cavities (Freel 1991).
- Maintain dense canopy cover (>60%) in the vicinity of large trees (Buskirk and Powell 1994).
- Retain and recruit large woody debris, including large-diameter (at least 15-inches DBH by 15 feet long) downed logs (Freel 1991, Buskirk and Powell 1994) and complex structure near the ground (e.g., downed logs, large downed branches, root masses, live branches) (Buskirk and Powell 1994).

- Retain a mosaic of late-successional coniferous or mixed forests and perform fuel treatments in patches, allowing adequate dispersal habitat for fishers and avoiding creation of large, open areas that have no overstory or shrub cover.
- Identify additional protection measures as deemed necessary to avoid disturbance during construction or restoration-related activities.

OWLS: Conduct surveys in the spring (beginning March 15) to determine if spotted owls are nesting or foraging in the vicinity of the construction/restoration area. If owls are present, the park construction project manager will work with park biologists to determine appropriate measures to avoid disturbance, such as no construction activities between 30 minutes before dusk and 30 minutes after dawn, and an approximate 1,250-foot buffer of no disturbance (light or noise) around nest trees from March 15 through August 31.

BATS: If a project targets any trees for removal during the winter, a biologist will survey for roosting bats the preceding fall (September and October). If the biologist suspects hibernation in a tree, do not remove that tree until mid-April to mid-May. If a project targets any trees for removal during the summer, a biologist should survey for roosting bats within one week prior to removal to determine if a bat maternal colony occurs in the tree.

The following are additional Best Management Practices from Appendix 2 of NPS *Procedural Manual 77-1: Wetland Protection*:

1. **Effects on hydrology and fluvial processes:** Action must have only negligible to minor, new adverse effects on site hydrology and fluvial processes, including flow, circulation, velocities, hydroperiods, water level fluctuations, sediment transport, channel morphology, and so on. Care must be taken to avoid any rutting caused by vehicles or equipment.
2. **Effects on fauna:** Action must have only negligible to minor, new adverse effects on normal movement, migration, reproduction, or health of aquatic or terrestrial fauna, including at low flow conditions.
3. **Water quality protection and certification:** Action is conducted so as to avoid degrading water quality to the maximum extent practicable. Measures must be employed to prevent or control spills of fuels, lubricants, or other contaminants from entering the waterway or wetland. Action is consistent with state water quality standards and Clean Water Act Section 401 certification requirements (check with appropriate state agency).
4. **Erosion and siltation controls:** Appropriate erosion and siltation controls must be maintained during construction, and all exposed soil or fill material must be permanently stabilized at the earliest practicable date.
5. **Proper maintenance:** Structure or fill must be properly maintained so as to avoid adverse impacts on aquatic environments or public safety.
6. **Heavy equipment use:** Heavy equipment use in wetlands must be avoided if at all possible. Heavy equipment used in wetlands must be placed on mats, or other measures must be taken to minimize soil and plant root disturbance and to preserve preconstruction elevations.
7. **Stockpiling material:** Whenever possible, excavated material must be placed on an upland site. However, when this is not feasible, temporary stockpiling of excavated material in wetlands must be placed on filter cloth, mats, or some other semipermeable surface, or comparable measures must be taken to ensure that underlying wetland habitat is protected. The material must be stabilized with straw bales, filter cloth, or other appropriate means to prevent reentry into the waterway or wetland.

8. **Removal of stockpiles and other temporary disturbances during construction:** Temporary stockpiles in wetlands must be removed in their entirety as soon as practicable. Wetland areas temporarily disturbed by stockpiling or other activities during construction must be returned to their pre-existing elevations, and soil, hydrology, and native vegetation communities must be restored as soon as practicable.
9. **Topsoil storage and reuse:** Revegetation of disturbed soil areas should be facilitated by salvaging and storing existing topsoil and reusing it in restoration efforts in accordance with NPS policies and guidance. Topsoil storage must be for as short a time as possible to prevent loss of seed and root viability, loss of organic matter, and degradation of the soil microbial community.
10. **Native plants:** Where plantings or seeding are required, native plant material must be obtained and used in accordance with NPS policies and guidance. Management techniques must be implemented to foster rapid development of target native plant communities and to eliminate invasion by exotic or other undesirable species.
11. **Boardwalk elevations:** Minimizing shade impacts, to the extent practicable, should be a consideration in designing boardwalks and similar structures. (Placing a boardwalk at an elevation above the vegetation surface at least equal to the width of the boardwalk is one way to minimize shading.)
12. **Wild and Scenic Rivers:** If the action qualifies as a water resources project pursuant to Section 7(a) of the Wild and Scenic Rivers Act, then appropriate project review and documentation requirements under Section 7(a) are required.
13. **Endangered species:** Action must not jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, including degradation of critical habitat (see *NPS Management Policies 2006* and guidance on threatened and endangered species).
14. **Historic properties:** Action must not have adverse effects on historic properties listed or eligible for listing in the National Register of Historic Places.

Refer to the *Restoration of the Mariposa Grove of Giant Sequoias Project Environmental Assessment* Appendix B for a complete list of Standard Mitigation Measures and resource-specific mitigation measures applicable to the proposed action. The proposed action has been designed to avoid or mitigate harmful effects to wetlands.