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STAFF REPORT AND RECOMMENDATION**ON CONSISTENCY DETERMINATION**

Consistency Determination No.	CD-014-08
Staff:	MPD-SF
File Date:	3/20/08
60th Day:	5/19/08
75th Day:	6/3/08
Commission Meeting:	5/9/08

FEDERAL AGENCY: **National Park Service**

PROJECT LOCATION: Lower Redwood Creek and Big Lagoon, Muir Beach, Marin County (Exhibit 1)

PROJECT DESCRIPTION: Wetland and Creek Restoration at Big Lagoon: restoration of wetland, riparian, and aquatic habitat, reduction of flooding on Pacific Way, and improvements to visitor access (Exhibits 2-4)

SUBSTANTIVE FILE DOCUMENTS: See page 18.

EXECUTIVE SUMMARY

The National Park Service (NPS) has submitted a consistency determination for a habitat restoration/flood control/public access improvement project called the Wetland and Creek Restoration at Big Lagoon, Muir Beach, Marin County. The site has been degraded by past human activities causing loss of natural creek function, including construction of the existing parking lot and levee within the flood plain, degradation of historic coho salmon and red legged frog habitat due to watershed modifications, flooding caused by inadequate channel capacity, sedimentation within the creek, and an undersized bridge (Pacific Way Bridge).

The NPS states that the proposed restoration actions focus on reconstructing natural geomorphology and function at the Big Lagoon site, combined with public access actions designed to emphasize a reduction in hydraulic impacts, while improving public access to a

functionally and visually restored Big Lagoon site. The NPS summarizes the project components as follows:

- *The preferred restoration alternative entails realignment of the creek to a natural topographic location, along with levee removal, associated riparian habitat restoration and creation of two new emergent wetlands to provide suitable breeding habitat for the California red-legged frog.*
- *The preferred public access alternative entails rotating the visitor parking lot to reduce its hydraulic impacts, but it will retain the existing parking capacity of 175 cars. A new multi-use trail will extend from Hwy 1 to the parking lot, providing new links to other proposed trail and shuttle links converging at the intersection of Hwy 1 and Pacific Way.*
- *The preferred bridge alternative is the longest feasible bridge, a 250-foot-long bridge over the newly relocated channel and adjacent floodplain, with a raised road approach.*

The project is consistent with 30233 of the Coastal Act, because it is an allowable use as restoration, is the least environmentally damaging alternative, and includes sufficient minimization and monitoring measures to assure that it will protect and improve wetland habitat. The project is consistent with the remaining tests of Section 30233 because it would avoid significant disruption to marine and wildlife habitats and water circulation and would improve functional capacity. The project is consistent with Sections 30236 and 30240 as an allowable use under both Sections (under 30240 as a use dependent on the resources, and under 30236 as one whose primary function is improvement of fish and wildlife habitat), and it is consistent with the remaining tests of these sections. The project would increase the biological productivity of the watershed, and improve wetlands and environmentally sensitive habitat areas (ESHA). Minimization, mitigation, and monitoring measures have been included to minimize short-term adverse effects and assure long-term success, and the long-term beneficial effects of creating and enhancing wetland and ESHA far outweigh any short-term adverse effects. The project is therefore consistent with the water quality, wetland, stream alteration, and environmentally sensitive habitat policies of the Coastal Act (Sections 30231, 30233, 30240, and 30236).

I. STAFF SUMMARY

A. Project Description. The National Park Service (NPS) proposes a habitat restoration/flood control/public access improvement project called the Wetland and Creek Restoration at Big Lagoon, Muir Beach, Marin County. Most of the 38.8-acre project site is owned and managed by the Golden Gate National Recreation Area (GGNRA), a unit of the NPS comprised of the wetland, creek and dune complex at the mouth of the 8.9-square mile Redwood Creek watershed. Pacific Way road and bridge (which is located within the site) is owned and managed by the Marin County Department Public Works.

The project site is bordered by Highway 1 to the east, the Pacific Ocean to the west, and coastal hills and Green Gulch Trail to the south. The project area includes the parking lot used as the primary access point for coastal visitors, an intermittent tidal lagoon and dunes at the beach, about 3,200 linear feet of Redwood Creek and adjacent riparian habitat, and a former cattle grazing pasture now dominated by a combination of emergent wetland vegetation (e.g., cattails and seasonal wetland vegetation).

Redwood Creek flows from the southwestern slopes of Mt. Tamalpais through the old growth redwood forest of Muir Woods National Monument into California State Parks land in Frank Valley, where the creek and its tributaries enter a relatively broad alluvial floodplain. The creek then flows to the project site, emptying into the Pacific Ocean at Muir Beach. The entire watershed is relatively pristine and publicly owned and protected, with only about 5% of the watershed developed. However, the project site at Muir Beach is one of the most disturbed areas of the watershed due to more than a century of landscape modifications, including a 1,300-linear foot levee bisecting the floodplain, the NPS visitor parking lot for Muir Beach, and the Pacific Way road and bridge.

The visitor parking lot was constructed in the early 1980s by the NPS using fill from a landslide over Highway 1 that occurred during the 1982 flood events. The elevation of the parking lot was raised in response to complaints about flooding on the existing parking lot. With a picnic area at the lower end closest to the creek, it is a fill pad extending about 500 feet across the Redwood Creek floodplain and rising about 3 to 4 feet above the adjacent floodplain.

The NPS describes the past human-caused modifications to the ecosystem driving the proposed restoration as follows:

An expansive open water lagoon fringed with emergent wetlands extended over most of the site for thousands of years and was recorded by government mappers in the mid-19th Century. The open water complex was lost by the early 20th Century due to elevated sediment delivery from disturbances in the upper watershed. During the 20th Century, landscape modifications for agriculture, road construction, tourism, and visitor access substantially confined Redwood Creek. The creek subsequently quickly filled with sediment, lost flow conveyance capacity, became unstable, and now causes routine flooding on Pacific Way. Residents are stranded during average winter rain events due to flooding on the road. The habitats at this coastal site are now highly fragmented, divided by a road and bridge, a levee used as a road and trail, and the Muir Beach visitor parking lot. The creek has very poor connectivity with its floodplain, which puts salmon at substantial risk of getting stranded, although floodplain habitat is one of the most important needs for salmonids in Redwood Creek.

The NPS states the project goals are to:

Restore a functional, self-sustaining ecosystem, including wetland, aquatic and riparian components;

Develop a restoration design that (1) functions in the context of the watershed and other pertinent regional boundaries, and (2) identifies and, to the extent possible, mitigates factors that reduce the site's full restoration potential;

Consistent with restoring a functional ecosystem, re-create and maintain habitat adequate to support sustainable populations of special status species;

Reduce flooding on Pacific Way and in the Muir Beach community caused by human modifications to the ecosystem, and work with Marin County to ensure that vehicle access is provided to the Muir Beach community;

Provide a visitor experience, public access, links to key locations, and resource interpretation that are compatible with the ecosystem restoration and historic preservation;

Work with the Federated Indians of Graton Rancheria to incorporate cultural values and indigenous archaeological site resources into the restoration design, visitor experience, and site stewardship;

Provide opportunities for public education and community-based restoration, including engaging local and broader communities in restoration planning and site stewardship; and

Coordinate with local transportation planning efforts to identify project features that are compatible with transportation improvements and consistent with the ecosystem restoration.

After extensive public outreach and preparation of an EIS/EIR,¹ NPS has selected its “preferred” alternative (Exhibits 2, 6 & 7). This alternative focuses on reconstructing natural geomorphology and function at the Big Lagoon site, combined with public access actions designed to emphasize a reduction in hydraulic impacts, with improvements to public access to a functionally and visually restored Big Lagoon site. The proposed Pacific Way Bridge alternative (analyzed, but not formally included in this consistency determination – see note, page 6 below) will be designed to maximize both natural channel function and vehicular access during storm events. The three primary project components include:

- *The preferred restoration alternative entails realignment of the creek to a natural topographic location, along with levee removal, associated riparian habitat restoration and creation of two new emergent wetlands to provide suitable breeding habitat for the California red-legged frog.*

¹ <http://parkplanning.nps.gov/document.cfm?parkID=303&projectId=12126&documentID=21520>

- *The preferred public access alternative entails rotating the visitor parking lot to reduce its hydraulic impacts, but it will retain the existing parking capacity of 175 cars. A new multi-use trail will extend from Hwy 1 to the parking lot, providing new links to other proposed trail and shuttle links converging at the intersection of Hwy 1 and Pacific Way.*
- *The preferred bridge alternative is the longest feasible bridge, a 250-foot-long bridge over the newly relocated channel and adjacent floodplain, with a raised road approach.*

The proposal includes the following features (described in greater detail in Exhibit 8):

Channel Modifications

NPS proposes to relocate a total of approximately 2,500 linear feet of creek channel to the topographically lowest location in what will be a substantially broader active floodplain. The redesigned creek will be designed to mimic natural systems and will include log structures downstream of Pacific Way to encourage development of natural habitat features for resident salmonids. Existing rock gabions in the creekbed will be removed. Backwater habitat will be retained for use by salmonids and to increase flood storage capacity. Ponds will be created to support red-legged frogs. An existing 1,300-linear foot levee that confines the creek floodplain and defines the boundary between NPS land and San Francisco Zen Center property will be removed, along with two existing culverts that convey the flows from the two Green Gulch tributaries (which will convert 1/3 acre of upland to wetland). Concrete lining in the southern Green Gulch tributary will be removed in the project area and the two drainages will be slightly rerouted and reconnected with the Redwood Creek channel to minimize construction impacts in the existing red-legged frog habitat.

Excavation will occur along the landward side of the intermittent tidal lagoon to enhance its natural variability, which will expand the open water lagoon. Large log structures will be installed in the tidal lagoon to create scour pools and cover favored by coho salmon in such habitats. Highly noxious kikuyu grass will be removed and the area will be restored with native wetland vegetation. Remnants of the non-historic Muir Beach Tavern in this area adjacent to the existing parking lot would also be removed to enhance the natural wetland function.

The existing parking lot will be rotated east-west and parallel to Pacific Way. Its capacity will be the same as the existing lot, 175 parked cars. It would include a new entrance from Pacific Way and 310 linear feet of stacking room for cars between the entrance and the first parking stall. The southern end of the existing parking lot and picnic area (about 0.73 acre) would be removed, creating a distance of about 350 feet from the bank of Redwood Creek and substantially expanding the floodplain area available for conveyance of high flows and sediment to the ocean. The reconstructed parking lot will occupy about 0.93 acres, 0.2 acres more than the existing lot (71,445 sq. ft. compared to 63,000 for the existing lot.) It will extend further northward into mature riparian habitat and will entail removing about 2,700 cubic yards (cu. yds.) of fill and placing about 5,700 cu. yds.

Reconfigured Picnic Area

The existing picnic area, totaling about 7,375 sq. ft. (0.17 acre), will be relocated adjacent to the newly reconfigured parking lot. It's area will be reduced to be between about 3,500 and 5,500 square feet (up to about 0.13 acre), or up to about 75% of its current size, allowing a gain of about 0.04 acres in wetlands.

New vault toilets will be constructed adjacent to the parking lot pad. The new accessible toilets will be constructed in a location to minimize impacts to visual, natural and cultural resources as well as to adjacent residences and other visitor uses. While installation entails excavation to construct and place the facility, the area affected will be within the footprint of the newly relocated parking lot and will not add to the total area of wetland fill.

Trail Access from Highway 1

The preferred alternative for visitor access includes the construction of a new pedestrian trail along Pacific Way from Highway 1 to the beach parking lot. The 1,200 foot-long trail would be about 5 feet wide, except where it is attached to the new Pacific Way Bridge where it would widen to 6 feet. The segment of the trail closest to Highway 1 would be built atop a new embankment on the south side of Pacific Way. [See Exhibits 2 & 8 for further details]

Pedestrian Access to Beach

A new pedestrian boardwalk and bridge crossing of the creek channel would extend from the new parking lot to the beach. The existing bridge and boardwalk will be replaced, but the exact locations of the boardwalk and bridge have not been determined at this time. The NPS has committed to coordinating with the Commission staff concerning whether (and if so, in what form) the finalized design of the pedestrian crossing would necessitate further consistency review. [See Exhibit 8 for further details]

Proposed New Pacific Way Bridge

The preferred bridge alternative identified in the Final EIS/EIR (Exhibit 4) is Alternative BR-4, the longest possible bridge. [Note: Because Pacific Way bridge is owned and operated by Marin County Department of Public Works, this third component is not formally included in this federal consistency review, as it will be Marin County's responsibility to obtain a coastal development permit for it. Thus it is described here for background purposes.]

The new bridge would provide access for residents and visitors during a very large magnitude event (i.e., much larger than a 10-year event and as close as possible to a 100-year event). Because it is the longest feasible bridge, spanning the entire floodplain, it will allow for improved natural function at the site by allowing for channel migration, floodplain connectivity and fish passage. It would have some benefits for reducing upstream flood elevations during moderate flow events, but not during very large events.

The 250-foot-long segment of Pacific Way that will be removed for the new span of the bridge will return about 0.11 acres of upland to wetland.

Other actions would include:

- purchase of a conservation easement for about 14.2 acres of the San Francisco Zen Center's Green Gulch Farm;
- disposal (26,000 cu. yds.) of fill excavated for the project will be disposed of in an unused reservoir pit on NPS property about 0.75 mile north of the project site at a location that is not visible from Hwy 1 (Figure 1), restoring an existing man-made feature into a more natural configuration;
- removal and relocation of existing utilities;
- if needed in preparation for winter storms, interim flood reduction measures, pending project completion in 2011, including excavating the channel from up to 400 feet upstream of the Pacific Way Bridge to as far as 100 feet downstream of the bridge, removal log jams upstream in the project area if they appear to be obstructing flood flows or contributing to sediment aggradation at the bridge;
- removing invasive non-native plant species. In particular, Cape ivy and non-native invasive perennial grasses, such as kikuyu grass, panic veldt grass, Harding grass, and tall fescue would be removed from various locations at the project site. Nonnative species outside the project boundary that would be likely to spread to the project site would also be targeted for removal, particularly the Harding grass in the alluvial fan south of the project boundary. Himalayan blackberry, the non-native blackberry, and other non-natives would also be targeted for removal;
- revegetation using native riparian and wetland vegetation at the NPS' native plant nursery in the Redwood Creek Watershed for outplanting at the project site. All propagules used in the nursery are collected in the Redwood Creek Watershed;
- installation of a temporary by-pass road adjacent to Pacific Way must be provided during construction of the new Pacific Way Bridge, since the road provides the only access to some Muir Beach homes; and
- temporary haul roads for construction in wetlands.

The NPS anticipates construction to begin in about 2009 and to take about three years to complete. Work will be limited to the non-rainy season.

B. Previous Commission Action. The Commission has supported and authorized a number of previous NPS proposals at and adjacent to the site, including:

(1) interim flood reduction prior to the implementation of the proposed restoration for NPS actions to reduce flooding on Pacific Way and prevent channel avulsion (NPS negative determinations ND-053-02, ND-071-04, and ND-103-05); and

(2) restoration of the 38 acre upstream “Banducci” site - NPS Restoration, Lower Redwood Creek Floodplain and Salmonid Habitat Restoration, Banducci Site (NPS, CD-026-07).

C. Federal Agency's Consistency Determination. The NPS has determined the project consistent to the maximum extent practicable with the California Coastal Management Program.

II. STAFF RECOMMENDATION:

The staff recommends that the Commission adopt the following motion:

MOTION: **I move that the Commission concur with consistency determination CD-014-08 that the project described therein is fully consistent, and thus is consistent to the maximum extent practicable, with the enforceable policies of the California Coastal Management Program (CCMP).**

STAFF RECOMMENDATION:

Staff recommends a **YES** vote on the motion. Passage of this motion will result in an agreement with the determination and adoption of the following resolution and findings. An affirmative vote of a majority of the Commissioners present is required to pass the motion.

RESOLUTION TO CONCUR WITH CONSISTENCY DETERMINATION:

The Commission hereby **concurs** with the consistency determination CD-014-08 by the National Park Service on the grounds that the project would be consistent with the enforceable policies of the CCMP.

III. FINDINGS AND DECLARATIONS:

The Commission finds and declares as follows:

A. Wetlands, Water Quality, Stream Alteration, and Environmentally Sensitive Habitat

Section 30231 of the Coastal Act provides:

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, ... controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, ...

maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Section 30233 provides, in part:

(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

...

(6) Restoration purposes.

...

(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation.

(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary.

Section 30236 provides:

Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the flood plain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.

Section 30240 provides:

(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

The project area includes an intermittent tidal lagoon and dunes at the beach, about 3,200 linear feet of Redwood Creek and adjacent riparian habitat, and a former cattle grazing pasture now

dominated by a combination of emergent wetland vegetation such as cattails and seasonal wetland vegetation. About 30.85 acres of wetland at the project site meet the definition as Coastal Act-defined wetlands (Exhibit 9, p. 34 of the exhibit).

The NPS states that the project is consistent with Sections 30230 and 30231 of the Coastal Act because the project will:

- *maintain or enhance the biological productivity of the coastal stream, wetland and estuary at the project site,*
- *enhance habitat for federally listed anadromous salmonids which spawn in freshwater and spend up to three years in the ocean environment,*
- *reduce or virtually eliminate existing substantial interferences with surface water flow patterns,*
- *substantially expand the natural vegetation buffers protecting riparian habitats, and*
- *undo historic alteration of the natural stream alignment and area available for floodplain.*

The NPS further states:

While maximum biological productivity, in and of itself, is not a goal of the restoration project, the project will maintain or enhance biological productivity because the project will restore a functional, self-sustaining ecosystem, including wetlands, riparian habitat, and habitat for sustainable populations of special status species, including salmonids and the California red-legged frog. The proposed actions will allow the most natural function of the site in almost a century. The substantial existing constraints on natural function due to infrastructure and hydraulic obstructions will be largely erased by project actions; and the aquatic system, with its diverse sub-habitats, will be allowed to evolve in response to natural processes. The realigned channel will be repositioned following an alignment which occurred prior to the creek's relocation during the early 20th Century. The relocation will both be more stable and allow natural geomorphic variation, create a natural channel gradient tied into the upstream gradient, improve sediment transport, improve flow conveyance, and increase floodplain connectivity.

The combined effect of the realigned channel, modified parking lot, levee removal, and the new Pacific Way Bridge will be to enhance both the quality and the quantity of winter-spring habitat for juvenile salmonids, one of the most critical needs for the federally listed coho and steelhead in Redwood Creek. During greater than average winter flood events, most of the riparian and wetland habitat in the 38-acre project site will be inundated, providing essential floodplain habitat for juvenile salmonids, and for the first time since the 1920's, the floodplain will be fully connected. With the removal

of the levee road, juvenile salmonids will be less likely to get stranded on the floodplain. In addition, with likely grading on the floodplain and new backwaters to be created, it is possible there will be an increase in the areal extent of winter-spring habitat of up to 2.1 acres under annual (Q1) flow events.

During construction, the project will be undertaken in a manner that seeks to avoid significant disruption to marine and wildlife habitats and water circulation. Where impacts are anticipated, mitigation and monitoring actions are planned to ensure that the quantity and quality of wetlands is improved.

Because it includes wetland fill, the project triggers the 3-part test of Section 30233(a) of the Coastal Act. The Commission therefore needs to analyze the project's consistency with the allowable use, alternatives, and mitigation tests of Section 30233(a). The Commission finds the project consistent with the allowable use test because the project's fundamental purpose is restoration.

Concerning the second test, the NPS considered a number of alternatives. Specifically, the NPS considered three alternatives for the restoration component of the project, five alternatives for the public access/parking lot component, and three alternatives for the Pacific Way Bridge component. Table 1 from the NPS' Alternatives Analysis (January 2008) (Exhibit 6) compares the physical differences between the three restoration alternatives (alternative 2 being the proposed alternative), and Exhibit 7 (pp 8-17 from the same document) explains why the NPS believes the proposed project is the least environmentally damaging feasible alternative. The NPS concludes:

Each of the proposed alternatives for restoration, public access and a new Pacific Way Bridge is the least environmentally damaging practicable alternative. This set of preferred alternatives minimizes impacts to ...[wetlands] while improving natural aquatic function, providing public and residential access to this popular coastal site, and minimizing other environmental impacts such as traffic congestion and impacts of hauling.

The Commission agrees and finds that the proposed project meets the second (alternatives) test of Section 30233(a). Concerning the third (mitigation) test, the Commission finds the project consistent because it includes sufficient minimization and monitoring measures to protect environmentally sensitive habitat, and to assure that it will increase the quantity and quality of wetlands. Therefore, no further mitigation is required.

Concerning Section 30236, the project is allowable as its primary function is the improvement of fish and wildlife habitat. Redwood Creek's channel bed has aggraded substantially in recent years, rising higher in elevation than its adjacent floodplain in several locations, resulting in channel instability such that even moderate storm events force flows across Pacific Way. The road is typically closed at least once each winter due to flooding where the alternate channel spills across the road.

Addressing overall project benefits, including environmentally sensitive habitat (Section 30240) and flood control issues (Section 30236), the NPS states:

While benefits and impacts of the restoration, public access, and bridge alternatives are analyzed separately in the Final EIS/EIR, the greatest benefits will occur from the combination of these three project components. Each component addresses a particular disruption of natural creek processes that have degraded a riverine system that historically sustained healthy salmonid fish populations and offered high quality wetland and wildlife habitat, while distributing and conveying large quantities of sediment and high stormwater flows. The combined benefit of the preferred alternative creek realignment, parking lot reconfiguration, and the Pacific Way Bridge will create the most unobstructed floodplain in the project area since about the 1920s. All components functioning together will improve flow conveyance, sediment transport, floodplain function and habitat value for salmonids and frogs, while also improving vehicular access and maintaining visitor and residential access in a manner that is the least environmentally damaging, practicable alternative.

The project is an allowable use under Section 30240 as on-site habitat restoration is inherently “a use dependent on the resources.” Additional details on how the project will benefit salmonids, red legged frogs, and other environmentally sensitive habitat (ESHA), as well as water quality and wetlands, is contained in Exhibit 9.

Conclusion

The Commission finds the project consistent with 30233 of the Coastal Act, because it is an allowable use as restoration, is the least environmentally damaging alternative, and includes sufficient minimization and monitoring measures to assure that it will protect and improve wetland habitat. The Commission also finds the project consistent with the remaining tests of Section 30233 because it would avoid significant disruption to marine and wildlife habitats and water circulation and would improve functional capacity. Therefore, the Commission concludes that the project is consistent with the wetlands policy (Section 30233) of the Coastal Act. The Commission finds the project consistent with Sections 30236 and 30240 as an allowable use under both Sections (under 30240 as a use dependent on the resources, and under 30236 as one whose primary function is improvement of fish and wildlife habitat). The Commission also finds the project consistent with the other tests of those policies. The project would increase the biological productivity of the watershed, and improve wetlands and ESHA. Although many of the actions taken in the project site may have short-term adverse effects, the NPS proposes mitigation measures that would minimize these effects, as well as monitoring to assure long-term success, and the Commission agrees that the long-term beneficial effects of creating and enhancing wetland and ESHA far outweigh any short-term adverse effects. The Commission therefore concludes that this project is consistent with the water quality, wetland, stream alteration, and environmentally sensitive habitat policies of the Coastal Act (Sections 30231, 30233, 30240, and 30236).

B. Public Access and Recreation. The Coastal Act provides:

Section 30210. In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Section 30211. Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Section 30212. (a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where: (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources, (2) adequate access exists nearby, or, (3) agriculture would be adversely affected. Dedicated accessway shall not be required to be opened to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway.

Section 30212.5. Wherever appropriate and feasible, public facilities, including parking areas or facilities, shall be distributed throughout an area so as to mitigate against the impacts, social and otherwise, of overcrowding or overuse by the public of any single area.

Section 30213. Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred.

Section 30214. (a) The public access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case including, but not limited to, the following:

- (1) Topographic and geologic site characteristics.*
- (2) The capacity of the site to sustain use and at what level of intensity.*
- (3) The appropriateness of limiting public access to the right to pass and repass depending on such factors as the fragility of the natural resources in the area and the proximity of the access area to adjacent residential uses.*
- (4) The need to provide for the management of access areas so as to protect the privacy of adjacent property owners and to protect the aesthetic values of the area by providing for the collection of litter.*

Muir Beach is a heavily used park (approximately 220,000 visitors per year), and the balancing of flood control, habitat needs, access and recreation needs, and the need to maintain

accessibility for area residents has necessitated a careful balancing of policy considerations, as required under Section 30214 above. The NPS states:

The proposed project is consistent with Sections 30210, 30211, and 30212.5 and 30214 of Article 2 of the CZMA because it will provide public access to the coastal zone in a way consistent with public safety needs and the needs to protect public rights, rights of private property owners, and natural resource areas from overuse. These topics are discussed below.

The location, the configuration, and the parking capacity of the modified parking lot have been selected to minimize the overall impact of the infrastructure and social uses on the natural area. By rotating the parking lot parallel to Pacific Way, the floodplain area available for high flow conveyance will be increased from about 50 feet to about 350 feet, thereby reducing flood elevations, creating functional floodplain habitat for federally listed salmonids, and allowing natural geomorphic processes to take place. Five other alternatives for parking lot capacities, locations and configurations were evaluated in the Final EIS/EIR. If parking capacity were either increased or decreased, there would be new impacts to parking and traffic congestion at the site. Analyses showed that smaller lots further from the beach would increase the impacts of social uses by expanding the area of impact due to new fill in wetlands, new trails, and the need for new infrastructure, since Pacific Way road and bridge would always have to remain functional for residents. Furthermore, if more than one location were available for either parking or drop-off, traffic congestion and safety issues would increase since drivers would be likely to drive to both locations in search of parking. If the parking lot was located upstream of the Pelican Inn off of Highway 1, new traffic impacts would result from a new ingress/egress off of Highway 1. The impacts of social uses are most appropriately minimized by maintaining a single location for the parking lot. The proposed parking capacity, location and configuration constitute the least environmentally damaging practicable alternative (LEDPA; see attached Alternatives Analysis). The proposed project is therefore consistent with Section 30212.5.

Private property rights are not at issue in this plan since the road to the visitor parking lot is a county-owned road. However, actions will benefit adjacent Muir Beach residents by allowing a better flow of traffic on Pacific Way due to the parking lot's added stacking room, the new entrance, and the new two-way bridge. Residents will also benefit from the new vehicular access over the bridge during even very large flood events. Numerous features are planned in the parking lot conceptual design to reduce impacts of visitation on adjacent neighbors. There will be a vegetated buffer, with trees, between Pacific Way and the new parking lot. The picnic area, restrooms and garbage cans will be relocated on the side of the parking lot furthest from the homes. NPS provides trash and recycling receptacles and collects trash and conducts other similar maintenance at the site.

Access to the coastal area will be enhanced by the new trail alignment along Pacific Way from Highway 1 to the parking lot and boardwalk. The new trail will enhance the connectedness among regional trails and create a direct connection with the proposed Dias Ridge Trail realignment, which is a separate project to route that trail to a terminus at Muir Beach directly across Highway 1 from the new Pacific Way trail. The Dias Ridge trail currently terminates further south on Highway 1 at a dangerous bend with no trail links to the beach.

Project construction is expected to result in temporary impacts to public access and visitor experience. Whenever possible, actions will be taken to minimize and/or mitigate these effects. NPS has committed to a public outreach campaign to keep the public informed of the projects progress, re-direct visitors to alternate locations, and provide opportunities for public involvement and stewardship. Further details are provided in the Final EIS/EIR (Section 4.3.4.1, pp. 4-215 to 4-245). In particular, see Tables 4.3.4.1-2 on p. 4-230.

Visitor parking at Muir Beach during construction would be maintained to the maximum extent possible. Portions of the parking lot may be used for staging areas, and so would result in reduced parking capacity. In addition, during construction of the new parking lot, as well as during other phases of construction, the parking lot may be closed entirely. The parking lot would be constructed in the off-peak or shoulder season when park visitation is less, if possible.

The NPS has also attempted to maximize and accommodate public transit to Muir Beach, through coordination with local transportation planning efforts to identify project features that are compatible with transportation improvements and consistent with the ecosystem restoration. The NPS notes that the Comprehensive Transportation Management Plan for Southern Marin Parklands (CTMP) included Muir Beach as one of several parkland destinations for which public transportation was considered. Further planning will be needed; the NPS notes:

CTMP analysts found that to make a shuttle service efficient and financially sustainable, a shuttle could not travel all the way down Pacific Way to the beach parking lot since the added time would substantially increase the time of the shuttle's round-trip, thereby increasing operational costs, reducing the number of trips that can be made in a day, increasing visitor wait periods, and reducing the likelihood of high use. No such service other than the Muir Woods shuttle is planned for this area at this time, and no other public transportation remains operational in this area since the Stage Coach, operated by the Marin County Transit District, discontinued service there in April 2007 due to low ridership. Nevertheless, NPS is committed to continued coordination with County transit planners through other planning processes. If bus or shuttle service is routed to Muir Beach in the future, the design of the new bridge and parking lot would be adequate to support these services; only minor modifications would be needed to accommodate a bus or shuttle stop at the parking area.

Public safety has been considered, as required under Section 30212 and 30214, and the project will improve public safety for Muir Beach residents and visitors by reducing access road/bridge flooding events. The NPS states:

The rotated parking lot and longer bridge will not constrict flood flows or sediment transport, contributing substantially to improved public safety. Public safety will be further enhanced because the new Pacific Way Bridge will accommodate two-way vehicle passage, reducing safety hazards, and it will have an attached multi-use pedestrian trail to segregate pedestrians from traffic. The new bridge will provide for vehicular passage during substantially greater flood events (up to or very close to a 100 year event), eliminating the virtually annual stranding that some Muir Beach residents experience during routine winter events.

The project will also protect the sensitive habitat in the area from overuse, as required by Section 30210. The NPS states:

Impacts of visitor-related infrastructure will be reduced substantially because the hydraulic obstruction created by the existing parking lot will be erased by rotating the parking lot, the levee road bisecting the wetland and riparian areas will be removed, and the existing Pacific Way Bridge will be large enough to span both the creek and the floodplain. Salmonid habitat enhancement from a newly-connected floodplain will be the result of modifications to visitor-related infrastructure. Also, since the levee road will be removed and the parking lot will be moved to the edge of the site, visitor use will be restricted to the perimeter of the site. This modification to visitor-related infrastructure will enhance the connectivity of the wetland, creek and riparian habitats and reduce the disturbances to aquatic life or wildlife from hikers, bikers, equestrians or maintenance operations.

Additional measures proposed to prevent overuse are shown in Exhibit 9. The NPS concludes:

By maintaining the existing parking lot capacity, avoiding actions that would increase visitation, modifying visitor-related infrastructure to decrease or remove its impacts on natural resource function, taking additional management actions to further reduce impacts on wetlands and dunes, and continuing management actions to avoid or reduce impacts on water levels or night skies, this project is consistent provisions related to the prevention of overuse in Sections 30210, 30212.5, and 30214 of the CZMA.

With respect to low cost recreation, considered under Section 30213, the NPS concludes:

No entrance or parking fees are charged at Muir Beach or are proposed to be charged under this project. The beach and adjacent areas for recreational opportunities are fully public. Recreational opportunities such as hiking, picnicking, bird watching, beach combing and other such activities are provided at the site and through its trail links.

The Commission agrees with the NPS that the proposed plan appropriately maintains existing levels of, and improves the quality of, public access and recreation at Muir Beach in a manner taking into account habitat, access, public safety, and other needs, balancing public and private property rights, protecting natural resource areas from overuse, distributing public facilities in a manner to avoid overcrowding or overuse by the public of any single area, and taking into account the need to regulate the time, place, and manner of public access considering the factors contained in Section 30214. The Commission therefore concludes the project is consistent with the public access and recreation policies (Sections 30210-30214) of the Coastal Act.

C. Archeological Resources. Section 30244 of the Coastal Act provides:

Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

The NPS has consulted with the California State Historic Preservation Officer (SHPO) and conducted survey and identification efforts to locate National Register of Historic Places-eligible properties in the project area. NPS has determined that the project will not have an adverse effect on such properties, and has received SHPO concurrence with this finding. NPS is also in formal consultation with the Federated Indians of the Graton Rancheria (FIGR) and tribal representatives will continue to be involved in archaeological work associated with indigenous sites. The NPS states:

NPS has undertaken extensive surveys of the project site to identify cultural resources within the project area (Barker et al, 2005; Meyer , 2002, 2003, and 2005, and Psota, 2006). Three pre-contact archaeological sites have been identified in the project area: CA-MRN-333 (Muir Beach Site), CA-MRN-674 (the Pelican Site), and the Fan Site (see pp. 3-57 and 3-58 of the Final EIS/EIR). Of these, CA-MRN-333 was listed on the National Register of Historic Places (NRHP) in 1979 and the other two sites are likely eligible for the NRHP, and are being treated as such. There is the potential that the three existing archaeological sites could comprise a precontact archaeological district under NRHP. In addition, the entire project area has moderate potential to contain previously undiscovered NRHP-eligible resources which may be discovered during project implementation.

The project has been designed to avoid impact to these sites. However, some of the proposed restoration actions (e.g., invasive plant removal near the Fan Site) and actions associated with changes to public access have the potential to disturb the existing archaeological sites as well as any potentially undiscovered sites in the project area. In all cases, mitigation measures would be implemented to reduce the impact below significance thresholds. Mitigation measures incorporate education for construction workers, archaeological and tribal monitoring during construction, guidelines for addressing inadvertent discoveries, measures to avoid compaction of

archaeological sites, and specifics on consultations that could be triggered during project construction. Depending on the circumstances, consultations may be initiated between NPS and SHPO and/or the Federated Indians of the Graton Rancheria. Mitigation measures are described in detail on pp. 4-210 through 4-213 of the FEIS. [See Exhibit 10]

In light of the archeological surveys the NPS has conducted on the site, and with the mitigation measures the NPS has committed to, the proposed project would not adversely affect archeological resources. Should an archeological or cultural resource be found, the mitigation measures will ensure that the resource would be protected and that any such discovery would directly benefit the understanding of historic uses in the region. The SHPO's letter of concurrence is attached as Exhibit 11. The Commission concludes that the project is consistent with the archeological resource protection policy (Section 30244) of the Coastal Act.

IV. SUBSTANTIVE FILE DOCUMENTS

1. National Park Service. Consistency Determination CD-014-08, Wetland and Creek Restoration at Big Lagoon.
2. National Park Service/Marin County. Final EIS/EIR, Wetland and Creek Restoration at Big Lagoon, Muir Beach, Marin Co., December 2007.
3. Consistency Determination CD-026-07, Lower Redwood Creek Floodplain and Salmonid Habitat Restoration National Park Service. Consistency Determination CD-026-07, Lower Redwood Creek Floodplain and Salmonid Habitat Restoration.
4. National Park Service. Lower Redwood Creek Floodplain and Salmonid Habitat Restoration, Banducci Site. Environmental Assessment. March 2007.
5. National Park Service. Lower Redwood Creek Interim Food Reduction Measures and Floodplain/Channel Restoration, near Muir Beach, Marin County. ND-053-02.
6. National Park Service. Easkoot Creek Restoration at Stinson Beach, Marin County. CD-040-03.

CALIFORNIA COASTAL COMMISSION

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STAFF REPORT AND RECOMMENDATION**ON CONSISTENCY DETERMINATION**

Consistency Determination No.	CD-014-08
Staff:	MPD-SF
File Date:	3/20/08
60th Day:	5/19/08
75th Day:	6/3/08
Commission Meeting:	5/9/08

FEDERAL AGENCY: **National Park Service**

PROJECT**LOCATION:**

Lower Redwood Creek and Big Lagoon, Muir Beach, Marin County (Exhibit 1)

PROJECT**DESCRIPTION:**

Wetland and Creek Restoration at Big Lagoon: restoration of wetland, riparian, and aquatic habitat, reduction of flooding on Pacific Way, and improvements to visitor access (Exhibits 2-4)

SUBSTANTIVE**FILE DOCUMENTS:**

See page 18.

EXECUTIVE SUMMARY

The National Park Service (NPS) has submitted a consistency determination for a habitat restoration/flood control/public access improvement project called the Wetland and Creek Restoration at Big Lagoon, Muir Beach, Marin County. The site has been degraded by past human activities causing loss of natural creek function, including construction of the existing parking lot and levee within the flood plain, degradation of historic coho salmon and red legged frog habitat due to watershed modifications, flooding caused by inadequate channel capacity, sedimentation within the creek, and an undersized bridge (Pacific Way Bridge).

The NPS states that the proposed restoration actions focus on reconstructing natural geomorphology and function at the Big Lagoon site, combined with public access actions designed to emphasize a reduction in hydraulic impacts, while improving public access to a

functionally and visually restored Big Lagoon site. The NPS summarizes the project components as follows:

- *The preferred restoration alternative entails realignment of the creek to a natural topographic location, along with levee removal, associated riparian habitat restoration and creation of two new emergent wetlands to provide suitable breeding habitat for the California red-legged frog.*
- *The preferred public access alternative entails rotating the visitor parking lot to reduce its hydraulic impacts, but it will retain the existing parking capacity of 175 cars. A new multi-use trail will extend from Hwy 1 to the parking lot, providing new links to other proposed trail and shuttle links converging at the intersection of Hwy 1 and Pacific Way.*
- *The preferred bridge alternative is the longest feasible bridge, a 250-foot-long bridge over the newly relocated channel and adjacent floodplain, with a raised road approach.*

The project is consistent with 30233 of the Coastal Act, because it is an allowable use as restoration, is the least environmentally damaging alternative, and includes sufficient minimization and monitoring measures to assure that it will protect and improve wetland habitat. The project is consistent with the remaining tests of Section 30233 because it would avoid significant disruption to marine and wildlife habitats and water circulation and would improve functional capacity. The project is consistent with Sections 30236 and 30240 as an allowable use under both Sections (under 30240 as a use dependent on the resources, and under 30236 as one whose primary function is improvement of fish and wildlife habitat), and it is consistent with the remaining tests of these sections. The project would increase the biological productivity of the watershed, and improve wetlands and environmentally sensitive habitat areas (ESHA). Minimization, mitigation, and monitoring measures have been included to minimize short-term adverse effects and assure long-term success, and the long-term beneficial effects of creating and enhancing wetland and ESHA far outweigh any short-term adverse effects. The project is therefore consistent with the water quality, wetland, stream alteration, and environmentally sensitive habitat policies of the Coastal Act (Sections 30231, 30233, 30240, and 30236).

I. STAFF SUMMARY

A. Project Description. The National Park Service (NPS) proposes a habitat restoration/flood control/public access improvement project called the Wetland and Creek Restoration at Big Lagoon, Muir Beach, Marin County. Most of the 38.8-acre project site is owned and managed by the Golden Gate National Recreation Area (GGNRA), a unit of the NPS comprised of the wetland, creek and dune complex at the mouth of the 8.9-square mile Redwood Creek watershed. Pacific Way road and bridge (which is located within the site) is owned and managed by the Marin County Department Public Works.

The project site is bordered by Highway 1 to the east, the Pacific Ocean to the west, and coastal hills and Green Gulch Trail to the south. The project area includes the parking lot used as the primary access point for coastal visitors, an intermittent tidal lagoon and dunes at the beach, about 3,200 linear feet of Redwood Creek and adjacent riparian habitat, and a former cattle grazing pasture now dominated by a combination of emergent wetland vegetation (e.g., cattails and seasonal wetland vegetation).

Redwood Creek flows from the southwestern slopes of Mt. Tamalpais through the old growth redwood forest of Muir Woods National Monument into California State Parks land in Frank Valley, where the creek and its tributaries enter a relatively broad alluvial floodplain. The creek then flows to the project site, emptying into the Pacific Ocean at Muir Beach. The entire watershed is relatively pristine and publicly owned and protected, with only about 5% of the watershed developed. However, the project site at Muir Beach is one of the most disturbed areas of the watershed due to more than a century of landscape modifications, including a 1,300-linear foot levee bisecting the floodplain, the NPS visitor parking lot for Muir Beach, and the Pacific Way road and bridge.

The visitor parking lot was constructed in the early 1980s by the NPS using fill from a landslide over Highway 1 that occurred during the 1982 flood events. The elevation of the parking lot was raised in response to complaints about flooding on the existing parking lot. With a picnic area at the lower end closest to the creek, it is a fill pad extending about 500 feet across the Redwood Creek floodplain and rising about 3 to 4 feet above the adjacent floodplain.

The NPS describes the past human-caused modifications to the ecosystem driving the proposed restoration as follows:

An expansive open water lagoon fringed with emergent wetlands extended over most of the site for thousands of years and was recorded by government mappers in the mid-19th Century. The open water complex was lost by the early 20th Century due to elevated sediment delivery from disturbances in the upper watershed. During the 20th Century, landscape modifications for agriculture, road construction, tourism, and visitor access substantially confined Redwood Creek. The creek subsequently quickly filled with sediment, lost flow conveyance capacity, became unstable, and now causes routine flooding on Pacific Way. Residents are stranded during average winter rain events due to flooding on the road. The habitats at this coastal site are now highly fragmented, divided by a road and bridge, a levee used as a road and trail, and the Muir Beach visitor parking lot. The creek has very poor connectivity with its floodplain, which puts salmon at substantial risk of getting stranded, although floodplain habitat is one of the most important needs for salmonids in Redwood Creek.

The NPS states the project goals are to:

Restore a functional, self-sustaining ecosystem, including wetland, aquatic and riparian components;

Develop a restoration design that (1) functions in the context of the watershed and other pertinent regional boundaries, and (2) identifies and, to the extent possible, mitigates factors that reduce the site's full restoration potential;

Consistent with restoring a functional ecosystem, re-create and maintain habitat adequate to support sustainable populations of special status species;

Reduce flooding on Pacific Way and in the Muir Beach community caused by human modifications to the ecosystem, and work with Marin County to ensure that vehicle access is provided to the Muir Beach community;

Provide a visitor experience, public access, links to key locations, and resource interpretation that are compatible with the ecosystem restoration and historic preservation;

Work with the Federated Indians of Graton Rancheria to incorporate cultural values and indigenous archaeological site resources into the restoration design, visitor experience, and site stewardship;

Provide opportunities for public education and community-based restoration, including engaging local and broader communities in restoration planning and site stewardship; and

Coordinate with local transportation planning efforts to identify project features that are compatible with transportation improvements and consistent with the ecosystem restoration.

After extensive public outreach and preparation of an EIS/EIR,¹ NPS has selected its “preferred” alternative (Exhibits 2, 6 & 7). This alternative focuses on reconstructing natural geomorphology and function at the Big Lagoon site, combined with public access actions designed to emphasize a reduction in hydraulic impacts, with improvements to public access to a functionally and visually restored Big Lagoon site. The proposed Pacific Way Bridge alternative (analyzed, but not formally included in this consistency determination – see note, page 6 below) will be designed to maximize both natural channel function and vehicular access during storm events. The three primary project components include:

- *The preferred restoration alternative entails realignment of the creek to a natural topographic location, along with levee removal, associated riparian habitat restoration and creation of two new emergent wetlands to provide suitable breeding habitat for the California red-legged frog.*

¹ <http://parkplanning.nps.gov/document.cfm?parkID=303&projectId=12126&documentID=21520>

- *The preferred public access alternative entails rotating the visitor parking lot to reduce its hydraulic impacts, but it will retain the existing parking capacity of 175 cars. A new multi-use trail will extend from Hwy 1 to the parking lot, providing new links to other proposed trail and shuttle links converging at the intersection of Hwy 1 and Pacific Way.*
- *The preferred bridge alternative is the longest feasible bridge, a 250-foot-long bridge over the newly relocated channel and adjacent floodplain, with a raised road approach.*

The proposal includes the following features (described in greater detail in Exhibit 8):

Channel Modifications

NPS proposes to relocate a total of approximately 2,500 linear feet of creek channel to the topographically lowest location in what will be a substantially broader active floodplain. The redesigned creek will be designed to mimic natural systems and will include log structures downstream of Pacific Way to encourage development of natural habitat features for resident salmonids. Existing rock gabions in the creekbed will be removed. Backwater habitat will be retained for use by salmonids and to increase flood storage capacity. Ponds will be created to support red-legged frogs. An existing 1,300-linear foot levee that confines the creek floodplain and defines the boundary between NPS land and San Francisco Zen Center property will be removed, along with two existing culverts that convey the flows from the two Green Gulch tributaries (which will convert 1/3 acre of upland to wetland). Concrete lining in the southern Green Gulch tributary will be removed in the project area and the two drainages will be slightly rerouted and reconnected with the Redwood Creek channel to minimize construction impacts in the existing red-legged frog habitat.

Excavation will occur along the landward side of the intermittent tidal lagoon to enhance its natural variability, which will expand the open water lagoon. Large log structures will be installed in the tidal lagoon to create scour pools and cover favored by coho salmon in such habitats. Highly noxious kikuyu grass will be removed and the area will be restored with native wetland vegetation. Remnants of the non-historic Muir Beach Tavern in this area adjacent to the existing parking lot would also be removed to enhance the natural wetland function.

The existing parking lot will be rotated east-west and parallel to Pacific Way. Its capacity will be the same as the existing lot, 175 parked cars. It would include a new entrance from Pacific Way and 310 linear feet of stacking room for cars between the entrance and the first parking stall. The southern end of the existing parking lot and picnic area (about 0.73 acre) would be removed, creating a distance of about 350 feet from the bank of Redwood Creek and substantially expanding the floodplain area available for conveyance of high flows and sediment to the ocean. The reconstructed parking lot will occupy about 0.93 acres, 0.2 acres more than the existing lot (71,445 sq. ft. compared to 63,000 for the existing lot.) It will extend further northward into mature riparian habitat and will entail removing about 2,700 cubic yards (cu. yds.) of fill and placing about 5,700 cu. yds.

Reconfigured Picnic Area

The existing picnic area, totaling about 7,375 sq. ft. (0.17 acre), will be relocated adjacent to the newly reconfigured parking lot. It's area will be reduced to be between about 3,500 and 5,500 square feet (up to about 0.13 acre), or up to about 75% of its current size, allowing a gain of about 0.04 acres in wetlands.

New vault toilets will be constructed adjacent to the parking lot pad. The new accessible toilets will be constructed in a location to minimize impacts to visual, natural and cultural resources as well as to adjacent residences and other visitor uses. While installation entails excavation to construct and place the facility, the area affected will be within the footprint of the newly relocated parking lot and will not add to the total area of wetland fill.

Trail Access from Highway 1

The preferred alternative for visitor access includes the construction of a new pedestrian trail along Pacific Way from Highway 1 to the beach parking lot. The 1,200 foot-long trail would be about 5 feet wide, except where it is attached to the new Pacific Way Bridge where it would widen to 6 feet. The segment of the trail closest to Highway 1 would be built atop a new embankment on the south side of Pacific Way. [See Exhibits 2 & 8 for further details]

Pedestrian Access to Beach

A new pedestrian boardwalk and bridge crossing of the creek channel would extend from the new parking lot to the beach. The existing bridge and boardwalk will be replaced, but the exact locations of the boardwalk and bridge have not been determined at this time. The NPS has committed to coordinating with the Commission staff concerning whether (and if so, in what form) the finalized design of the pedestrian crossing would necessitate further consistency review. [See Exhibit 8 for further details]

Proposed New Pacific Way Bridge

The preferred bridge alternative identified in the Final EIS/EIR (Exhibit 4) is Alternative BR-4, the longest possible bridge. [Note: Because Pacific Way bridge is owned and operated by Marin County Department of Public Works, this third component is not formally included in this federal consistency review, as it will be Marin County's responsibility to obtain a coastal development permit for it. Thus it is described here for background purposes.]

The new bridge would provide access for residents and visitors during a very large magnitude event (i.e., much larger than a 10-year event and as close as possible to a 100-year event). Because it is the longest feasible bridge, spanning the entire floodplain, it will allow for improved natural function at the site by allowing for channel migration, floodplain connectivity and fish passage. It would have some benefits for reducing upstream flood elevations during moderate flow events, but not during very large events.

The 250-foot-long segment of Pacific Way that will be removed for the new span of the bridge will return about 0.11 acres of upland to wetland.

Other actions would include:

- purchase of a conservation easement for about 14.2 acres of the San Francisco Zen Center's Green Gulch Farm;
- disposal (26,000 cu. yds.) of fill excavated for the project will be disposed of in an unused reservoir pit on NPS property about 0.75 mile north of the project site at a location that is not visible from Hwy 1 (Figure 1), restoring an existing man-made feature into a more natural configuration;
- removal and relocation of existing utilities;
- if needed in preparation for winter storms, interim flood reduction measures, pending project completion in 2011, including excavating the channel from up to 400 feet upstream of the Pacific Way Bridge to as far as 100 feet downstream of the bridge, removal log jams upstream in the project area if they appear to be obstructing flood flows or contributing to sediment aggradation at the bridge;
- removing invasive non-native plant species. In particular, Cape ivy and non-native invasive perennial grasses, such as kikuyu grass, panic veldt grass, Harding grass, and tall fescue would be removed from various locations at the project site. Nonnative species outside the project boundary that would be likely to spread to the project site would also be targeted for removal, particularly the Harding grass in the alluvial fan south of the project boundary. Himalayan blackberry, the non-native blackberry, and other non-natives would also be targeted for removal;
- revegetation using native riparian and wetland vegetation at the NPS' native plant nursery in the Redwood Creek Watershed for outplanting at the project site. All propagules used in the nursery are collected in the Redwood Creek Watershed;
- installation of a temporary by-pass road adjacent to Pacific Way must be provided during construction of the new Pacific Way Bridge, since the road provides the only access to some Muir Beach homes; and
- temporary haul roads for construction in wetlands.

The NPS anticipates construction to begin in about 2009 and to take about three years to complete. Work will be limited to the non-rainy season.

B. Previous Commission Action. The Commission has supported and authorized a number of previous NPS proposals at and adjacent to the site, including:

(1) interim flood reduction prior to the implementation of the proposed restoration for NPS actions to reduce flooding on Pacific Way and prevent channel avulsion (NPS negative determinations ND-053-02, ND-071-04, and ND-103-05); and

(2) restoration of the 38 acre upstream “Banducci” site - NPS Restoration, Lower Redwood Creek Floodplain and Salmonid Habitat Restoration, Banducci Site (NPS, CD-026-07).

C. Federal Agency's Consistency Determination. The NPS has determined the project consistent to the maximum extent practicable with the California Coastal Management Program.

II. STAFF RECOMMENDATION:

The staff recommends that the Commission adopt the following motion:

MOTION: **I move that the Commission concur with consistency determination CD-014-08 that the project described therein is fully consistent, and thus is consistent to the maximum extent practicable, with the enforceable policies of the California Coastal Management Program (CCMP).**

STAFF RECOMMENDATION:

Staff recommends a **YES** vote on the motion. Passage of this motion will result in an agreement with the determination and adoption of the following resolution and findings. An affirmative vote of a majority of the Commissioners present is required to pass the motion.

RESOLUTION TO CONCUR WITH CONSISTENCY DETERMINATION:

The Commission hereby **concurs** with the consistency determination CD-014-08 by the National Park Service on the grounds that the project would be consistent with the enforceable policies of the CCMP.

III. FINDINGS AND DECLARATIONS:

The Commission finds and declares as follows:

A. Wetlands, Water Quality, Stream Alteration, and Environmentally Sensitive Habitat

Section 30231 of the Coastal Act provides:

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, ... controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, ...

maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Section 30233 provides, in part:

(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

...

(6) Restoration purposes.

...

(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation.

(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary.

Section 30236 provides:

Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the flood plain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.

Section 30240 provides:

(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

The project area includes an intermittent tidal lagoon and dunes at the beach, about 3,200 linear feet of Redwood Creek and adjacent riparian habitat, and a former cattle grazing pasture now

dominated by a combination of emergent wetland vegetation such as cattails and seasonal wetland vegetation. About 30.85 acres of wetland at the project site meet the definition as Coastal Act-defined wetlands (Exhibit 9, p. 34 of the exhibit).

The NPS states that the project is consistent with Sections 30230 and 30231 of the Coastal Act because the project will:

- *maintain or enhance the biological productivity of the coastal stream, wetland and estuary at the project site,*
- *enhance habitat for federally listed anadromous salmonids which spawn in freshwater and spend up to three years in the ocean environment,*
- *reduce or virtually eliminate existing substantial interferences with surface water flow patterns,*
- *substantially expand the natural vegetation buffers protecting riparian habitats, and*
- *undo historic alteration of the natural stream alignment and area available for floodplain.*

The NPS further states:

While maximum biological productivity, in and of itself, is not a goal of the restoration project, the project will maintain or enhance biological productivity because the project will restore a functional, self-sustaining ecosystem, including wetlands, riparian habitat, and habitat for sustainable populations of special status species, including salmonids and the California red-legged frog. The proposed actions will allow the most natural function of the site in almost a century. The substantial existing constraints on natural function due to infrastructure and hydraulic obstructions will be largely erased by project actions; and the aquatic system, with its diverse sub-habitats, will be allowed to evolve in response to natural processes. The realigned channel will be repositioned following an alignment which occurred prior to the creek's relocation during the early 20th Century. The relocation will both be more stable and allow natural geomorphic variation, create a natural channel gradient tied into the upstream gradient, improve sediment transport, improve flow conveyance, and increase floodplain connectivity.

The combined effect of the realigned channel, modified parking lot, levee removal, and the new Pacific Way Bridge will be to enhance both the quality and the quantity of winter-spring habitat for juvenile salmonids, one of the most critical needs for the federally listed coho and steelhead in Redwood Creek. During greater than average winter flood events, most of the riparian and wetland habitat in the 38-acre project site will be inundated, providing essential floodplain habitat for juvenile salmonids, and for the first time since the 1920's, the floodplain will be fully connected. With the removal

of the levee road, juvenile salmonids will be less likely to get stranded on the floodplain. In addition, with likely grading on the floodplain and new backwaters to be created, it is possible there will be an increase in the areal extent of winter-spring habitat of up to 2.1 acres under annual (Q1) flow events.

During construction, the project will be undertaken in a manner that seeks to avoid significant disruption to marine and wildlife habitats and water circulation. Where impacts are anticipated, mitigation and monitoring actions are planned to ensure that the quantity and quality of wetlands is improved.

Because it includes wetland fill, the project triggers the 3-part test of Section 30233(a) of the Coastal Act. The Commission therefore needs to analyze the project's consistency with the allowable use, alternatives, and mitigation tests of Section 30233(a). The Commission finds the project consistent with the allowable use test because the project's fundamental purpose is restoration.

Concerning the second test, the NPS considered a number of alternatives. Specifically, the NPS considered three alternatives for the restoration component of the project, five alternatives for the public access/parking lot component, and three alternatives for the Pacific Way Bridge component. Table 1 from the NPS' Alternatives Analysis (January 2008) (Exhibit 6) compares the physical differences between the three restoration alternatives (alternative 2 being the proposed alternative), and Exhibit 7 (pp 8-17 from the same document) explains why the NPS believes the proposed project is the least environmentally damaging feasible alternative. The NPS concludes:

Each of the proposed alternatives for restoration, public access and a new Pacific Way Bridge is the least environmentally damaging practicable alternative. This set of preferred alternatives minimizes impacts to ...[wetlands] while improving natural aquatic function, providing public and residential access to this popular coastal site, and minimizing other environmental impacts such as traffic congestion and impacts of hauling.

The Commission agrees and finds that the proposed project meets the second (alternatives) test of Section 30233(a). Concerning the third (mitigation) test, the Commission finds the project consistent because it includes sufficient minimization and monitoring measures to protect environmentally sensitive habitat, and to assure that it will increase the quantity and quality of wetlands. Therefore, no further mitigation is required.

Concerning Section 30236, the project is allowable as its primary function is the improvement of fish and wildlife habitat. Redwood Creek's channel bed has aggraded substantially in recent years, rising higher in elevation than its adjacent floodplain in several locations, resulting in channel instability such that even moderate storm events force flows across Pacific Way. The road is typically closed at least once each winter due to flooding where the alternate channel spills across the road.

Addressing overall project benefits, including environmentally sensitive habitat (Section 30240) and flood control issues (Section 30236), the NPS states:

While benefits and impacts of the restoration, public access, and bridge alternatives are analyzed separately in the Final EIS/EIR, the greatest benefits will occur from the combination of these three project components. Each component addresses a particular disruption of natural creek processes that have degraded a riverine system that historically sustained healthy salmonid fish populations and offered high quality wetland and wildlife habitat, while distributing and conveying large quantities of sediment and high stormwater flows. The combined benefit of the preferred alternative creek realignment, parking lot reconfiguration, and the Pacific Way Bridge will create the most unobstructed floodplain in the project area since about the 1920s. All components functioning together will improve flow conveyance, sediment transport, floodplain function and habitat value for salmonids and frogs, while also improving vehicular access and maintaining visitor and residential access in a manner that is the least environmentally damaging, practicable alternative.

The project is an allowable use under Section 30240 as on-site habitat restoration is inherently “a use dependent on the resources.” Additional details on how the project will benefit salmonids, red legged frogs, and other environmentally sensitive habitat (ESHA), as well as water quality and wetlands, is contained in Exhibit 9.

Conclusion

The Commission finds the project consistent with 30233 of the Coastal Act, because it is an allowable use as restoration, is the least environmentally damaging alternative, and includes sufficient minimization and monitoring measures to assure that it will protect and improve wetland habitat. The Commission also finds the project consistent with the remaining tests of Section 30233 because it would avoid significant disruption to marine and wildlife habitats and water circulation and would improve functional capacity. Therefore, the Commission concludes that the project is consistent with the wetlands policy (Section 30233) of the Coastal Act. The Commission finds the project consistent with Sections 30236 and 30240 as an allowable use under both Sections (under 30240 as a use dependent on the resources, and under 30236 as one whose primary function is improvement of fish and wildlife habitat). The Commission also finds the project consistent with the other tests of those policies. The project would increase the biological productivity of the watershed, and improve wetlands and ESHA. Although many of the actions taken in the project site may have short-term adverse effects, the NPS proposes mitigation measures that would minimize these effects, as well as monitoring to assure long-term success, and the Commission agrees that the long-term beneficial effects of creating and enhancing wetland and ESHA far outweigh any short-term adverse effects. The Commission therefore concludes that this project is consistent with the water quality, wetland, stream alteration, and environmentally sensitive habitat policies of the Coastal Act (Sections 30231, 30233, 30240, and 30236).

B. Public Access and Recreation. The Coastal Act provides:

Section 30210. In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Section 30211. Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Section 30212. (a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where: (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources, (2) adequate access exists nearby, or, (3) agriculture would be adversely affected. Dedicated accessway shall not be required to be opened to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway.

Section 30212.5. Wherever appropriate and feasible, public facilities, including parking areas or facilities, shall be distributed throughout an area so as to mitigate against the impacts, social and otherwise, of overcrowding or overuse by the public of any single area.

Section 30213. Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred.

Section 30214. (a) The public access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case including, but not limited to, the following:

- (1) Topographic and geologic site characteristics.*
- (2) The capacity of the site to sustain use and at what level of intensity.*
- (3) The appropriateness of limiting public access to the right to pass and repass depending on such factors as the fragility of the natural resources in the area and the proximity of the access area to adjacent residential uses.*
- (4) The need to provide for the management of access areas so as to protect the privacy of adjacent property owners and to protect the aesthetic values of the area by providing for the collection of litter.*

Muir Beach is a heavily used park (approximately 220,000 visitors per year), and the balancing of flood control, habitat needs, access and recreation needs, and the need to maintain

accessibility for area residents has necessitated a careful balancing of policy considerations, as required under Section 30214 above. The NPS states:

The proposed project is consistent with Sections 30210, 30211, and 30212.5 and 30214 of Article 2 of the CZMA because it will provide public access to the coastal zone in a way consistent with public safety needs and the needs to protect public rights, rights of private property owners, and natural resource areas from overuse. These topics are discussed below.

The location, the configuration, and the parking capacity of the modified parking lot have been selected to minimize the overall impact of the infrastructure and social uses on the natural area. By rotating the parking lot parallel to Pacific Way, the floodplain area available for high flow conveyance will be increased from about 50 feet to about 350 feet, thereby reducing flood elevations, creating functional floodplain habitat for federally listed salmonids, and allowing natural geomorphic processes to take place. Five other alternatives for parking lot capacities, locations and configurations were evaluated in the Final EIS/EIR. If parking capacity were either increased or decreased, there would be new impacts to parking and traffic congestion at the site. Analyses showed that smaller lots further from the beach would increase the impacts of social uses by expanding the area of impact due to new fill in wetlands, new trails, and the need for new infrastructure, since Pacific Way road and bridge would always have to remain functional for residents. Furthermore, if more than one location were available for either parking or drop-off, traffic congestion and safety issues would increase since drivers would be likely to drive to both locations in search of parking. If the parking lot was located upstream of the Pelican Inn off of Highway 1, new traffic impacts would result from a new ingress/egress off of Highway 1. The impacts of social uses are most appropriately minimized by maintaining a single location for the parking lot. The proposed parking capacity, location and configuration constitute the least environmentally damaging practicable alternative (LEDPA; see attached Alternatives Analysis). The proposed project is therefore consistent with Section 30212.5.

Private property rights are not at issue in this plan since the road to the visitor parking lot is a county-owned road. However, actions will benefit adjacent Muir Beach residents by allowing a better flow of traffic on Pacific Way due to the parking lot's added stacking room, the new entrance, and the new two-way bridge. Residents will also benefit from the new vehicular access over the bridge during even very large flood events. Numerous features are planned in the parking lot conceptual design to reduce impacts of visitation on adjacent neighbors. There will be a vegetated buffer, with trees, between Pacific Way and the new parking lot. The picnic area, restrooms and garbage cans will be relocated on the side of the parking lot furthest from the homes. NPS provides trash and recycling receptacles and collects trash and conducts other similar maintenance at the site.

Access to the coastal area will be enhanced by the new trail alignment along Pacific Way from Highway 1 to the parking lot and boardwalk. The new trail will enhance the connectedness among regional trails and create a direct connection with the proposed Dias Ridge Trail realignment, which is a separate project to route that trail to a terminus at Muir Beach directly across Highway 1 from the new Pacific Way trail. The Dias Ridge trail currently terminates further south on Highway 1 at a dangerous bend with no trail links to the beach.

Project construction is expected to result in temporary impacts to public access and visitor experience. Whenever possible, actions will be taken to minimize and/or mitigate these effects. NPS has committed to a public outreach campaign to keep the public informed of the projects progress, re-direct visitors to alternate locations, and provide opportunities for public involvement and stewardship. Further details are provided in the Final EIS/EIR (Section 4.3.4.1, pp. 4-215 to 4-245). In particular, see Tables 4.3.4.1-2 on p. 4-230.

Visitor parking at Muir Beach during construction would be maintained to the maximum extent possible. Portions of the parking lot may be used for staging areas, and so would result in reduced parking capacity. In addition, during construction of the new parking lot, as well as during other phases of construction, the parking lot may be closed entirely. The parking lot would be constructed in the off-peak or shoulder season when park visitation is less, if possible.

The NPS has also attempted to maximize and accommodate public transit to Muir Beach, through coordination with local transportation planning efforts to identify project features that are compatible with transportation improvements and consistent with the ecosystem restoration. The NPS notes that the Comprehensive Transportation Management Plan for Southern Marin Parklands (CTMP) included Muir Beach as one of several parkland destinations for which public transportation was considered. Further planning will be needed; the NPS notes:

CTMP analysts found that to make a shuttle service efficient and financially sustainable, a shuttle could not travel all the way down Pacific Way to the beach parking lot since the added time would substantially increase the time of the shuttle's round-trip, thereby increasing operational costs, reducing the number of trips that can be made in a day, increasing visitor wait periods, and reducing the likelihood of high use. No such service other than the Muir Woods shuttle is planned for this area at this time, and no other public transportation remains operational in this area since the Stage Coach, operated by the Marin County Transit District, discontinued service there in April 2007 due to low ridership. Nevertheless, NPS is committed to continued coordination with County transit planners through other planning processes. If bus or shuttle service is routed to Muir Beach in the future, the design of the new bridge and parking lot would be adequate to support these services; only minor modifications would be needed to accommodate a bus or shuttle stop at the parking area.

Public safety has been considered, as required under Section 30212 and 30214, and the project will improve public safety for Muir Beach residents and visitors by reducing access road/bridge flooding events. The NPS states:

The rotated parking lot and longer bridge will not constrict flood flows or sediment transport, contributing substantially to improved public safety. Public safety will be further enhanced because the new Pacific Way Bridge will accommodate two-way vehicle passage, reducing safety hazards, and it will have an attached multi-use pedestrian trail to segregate pedestrians from traffic. The new bridge will provide for vehicular passage during substantially greater flood events (up to or very close to a 100 year event), eliminating the virtually annual stranding that some Muir Beach residents experience during routine winter events.

The project will also protect the sensitive habitat in the area from overuse, as required by Section 30210. The NPS states:

Impacts of visitor-related infrastructure will be reduced substantially because the hydraulic obstruction created by the existing parking lot will be erased by rotating the parking lot, the levee road bisecting the wetland and riparian areas will be removed, and the existing Pacific Way Bridge will be large enough to span both the creek and the floodplain. Salmonid habitat enhancement from a newly-connected floodplain will be the result of modifications to visitor-related infrastructure. Also, since the levee road will be removed and the parking lot will be moved to the edge of the site, visitor use will be restricted to the perimeter of the site. This modification to visitor-related infrastructure will enhance the connectivity of the wetland, creek and riparian habitats and reduce the disturbances to aquatic life or wildlife from hikers, bikers, equestrians or maintenance operations.

Additional measures proposed to prevent overuse are shown in Exhibit 9. The NPS concludes:

By maintaining the existing parking lot capacity, avoiding actions that would increase visitation, modifying visitor-related infrastructure to decrease or remove its impacts on natural resource function, taking additional management actions to further reduce impacts on wetlands and dunes, and continuing management actions to avoid or reduce impacts on water levels or night skies, this project is consistent provisions related to the prevention of overuse in Sections 30210, 30212.5, and 30214 of the CZMA.

With respect to low cost recreation, considered under Section 30213, the NPS concludes:

No entrance or parking fees are charged at Muir Beach or are proposed to be charged under this project. The beach and adjacent areas for recreational opportunities are fully public. Recreational opportunities such as hiking, picnicking, bird watching, beach combing and other such activities are provided at the site and through its trail links.

The Commission agrees with the NPS that the proposed plan appropriately maintains existing levels of, and improves the quality of, public access and recreation at Muir Beach in a manner taking into account habitat, access, public safety, and other needs, balancing public and private property rights, protecting natural resource areas from overuse, distributing public facilities in a manner to avoid overcrowding or overuse by the public of any single area, and taking into account the need to regulate the time, place, and manner of public access considering the factors contained in Section 30214. The Commission therefore concludes the project is consistent with the public access and recreation policies (Sections 30210-30214) of the Coastal Act.

C. Archeological Resources. Section 30244 of the Coastal Act provides:

Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

The NPS has consulted with the California State Historic Preservation Officer (SHPO) and conducted survey and identification efforts to locate National Register of Historic Places-eligible properties in the project area. NPS has determined that the project will not have an adverse effect on such properties, and has received SHPO concurrence with this finding. NPS is also in formal consultation with the Federated Indians of the Graton Rancheria (FIGR) and tribal representatives will continue to be involved in archaeological work associated with indigenous sites. The NPS states:

NPS has undertaken extensive surveys of the project site to identify cultural resources within the project area (Barker et al, 2005; Meyer , 2002, 2003, and 2005, and Psota, 2006). Three pre-contact archaeological sites have been identified in the project area: CA-MRN-333 (Muir Beach Site), CA-MRN-674 (the Pelican Site), and the Fan Site (see pp. 3-57 and 3-58 of the Final EIS/EIR). Of these, CA-MRN-333 was listed on the National Register of Historic Places (NRHP) in 1979 and the other two sites are likely eligible for the NRHP, and are being treated as such. There is the potential that the three existing archaeological sites could comprise a precontact archaeological district under NRHP. In addition, the entire project area has moderate potential to contain previously undiscovered NRHP-eligible resources which may be discovered during project implementation.

The project has been designed to avoid impact to these sites. However, some of the proposed restoration actions (e.g., invasive plant removal near the Fan Site) and actions associated with changes to public access have the potential to disturb the existing archaeological sites as well as any potentially undiscovered sites in the project area. In all cases, mitigation measures would be implemented to reduce the impact below significance thresholds. Mitigation measures incorporate education for construction workers, archaeological and tribal monitoring during construction, guidelines for addressing inadvertent discoveries, measures to avoid compaction of

archaeological sites, and specifics on consultations that could be triggered during project construction. Depending on the circumstances, consultations may be initiated between NPS and SHPO and/or the Federated Indians of the Graton Rancheria. Mitigation measures are described in detail on pp. 4-210 through 4-213 of the FEIS. [See Exhibit 10]

In light of the archeological surveys the NPS has conducted on the site, and with the mitigation measures the NPS has committed to, the proposed project would not adversely affect archeological resources. Should an archeological or cultural resource be found, the mitigation measures will ensure that the resource would be protected and that any such discovery would directly benefit the understanding of historic uses in the region. The SHPO's letter of concurrence is attached as Exhibit 11. The Commission concludes that the project is consistent with the archeological resource protection policy (Section 30244) of the Coastal Act.

IV. SUBSTANTIVE FILE DOCUMENTS

1. National Park Service. Consistency Determination CD-014-08, Wetland and Creek Restoration at Big Lagoon.
2. National Park Service/Marin County. Final EIS/EIR, Wetland and Creek Restoration at Big Lagoon, Muir Beach, Marin Co., December 2007.
3. Consistency Determination CD-026-07, Lower Redwood Creek Floodplain and Salmonid Habitat Restoration National Park Service. Consistency Determination CD-026-07, Lower Redwood Creek Floodplain and Salmonid Habitat Restoration.
4. National Park Service. Lower Redwood Creek Floodplain and Salmonid Habitat Restoration, Banducci Site. Environmental Assessment. March 2007.
5. National Park Service. Lower Redwood Creek Interim Food Reduction Measures and Floodplain/Channel Restoration, near Muir Beach, Marin County. ND-053-02.
6. National Park Service. Easkoot Creek Restoration at Stinson Beach, Marin County. CD-040-03.

Redwood Creek Watershed

Project Site

1 mile

San Francisco Bay

Marin County

Project Site

San Francisco

Pacific Ocean

EXHIBIT NO. 1

APPLICATION NO.

CD 44-08

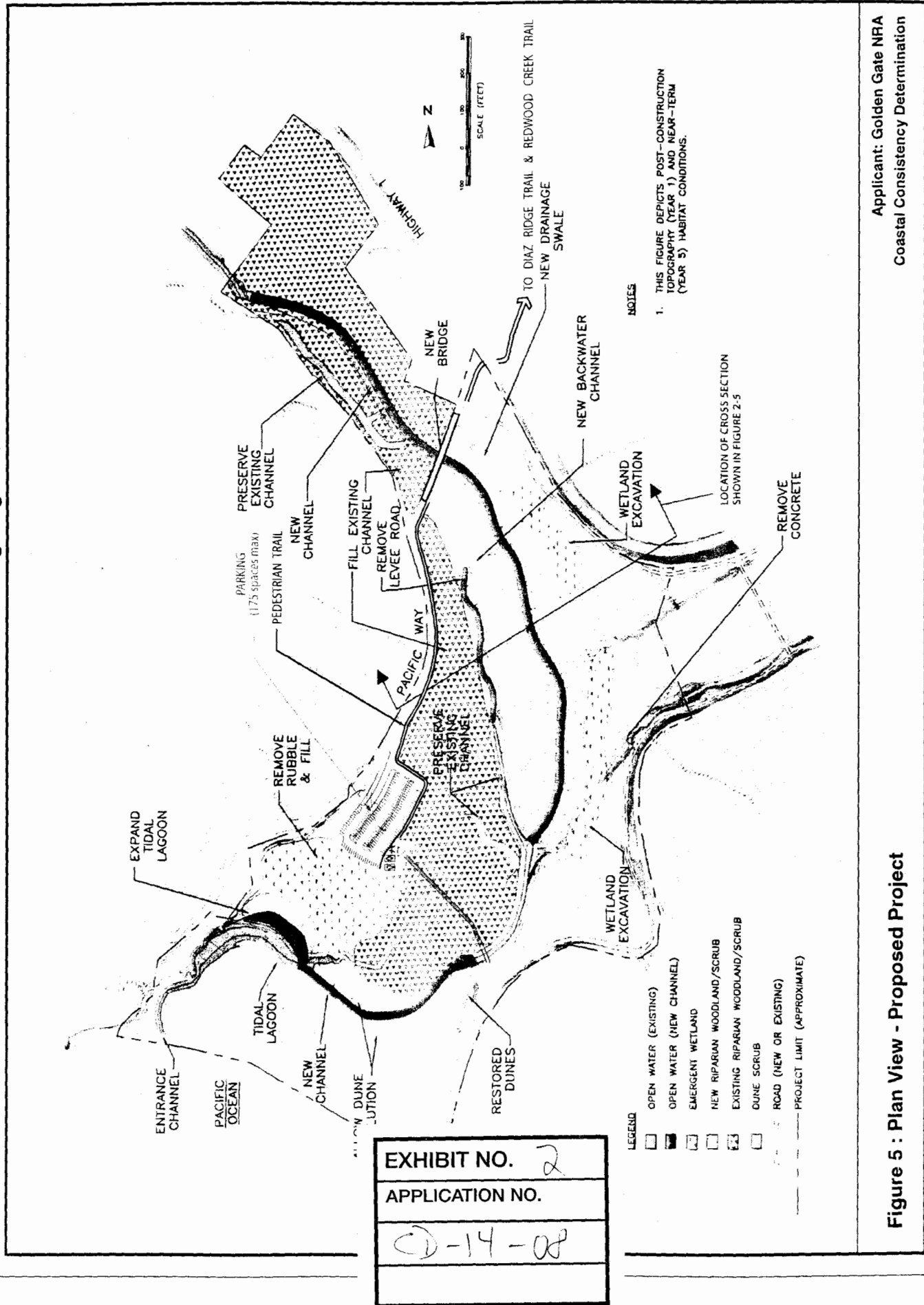
GNRA Managed Lands

Figure 1: Project Location

Applicant: Golden Gate NRA
Coastal Consistency Determination

CD-14-08

Wetland and Creek Restoration at Big Lagoon, Muir Beach, CA



Applicant: Golden Gate NRA
Coastal Consistency Determination

Figure 5 : Plan View - Proposed Project

Wetland and Creek Restoration at Big Lagoon, Muir Beach, CA

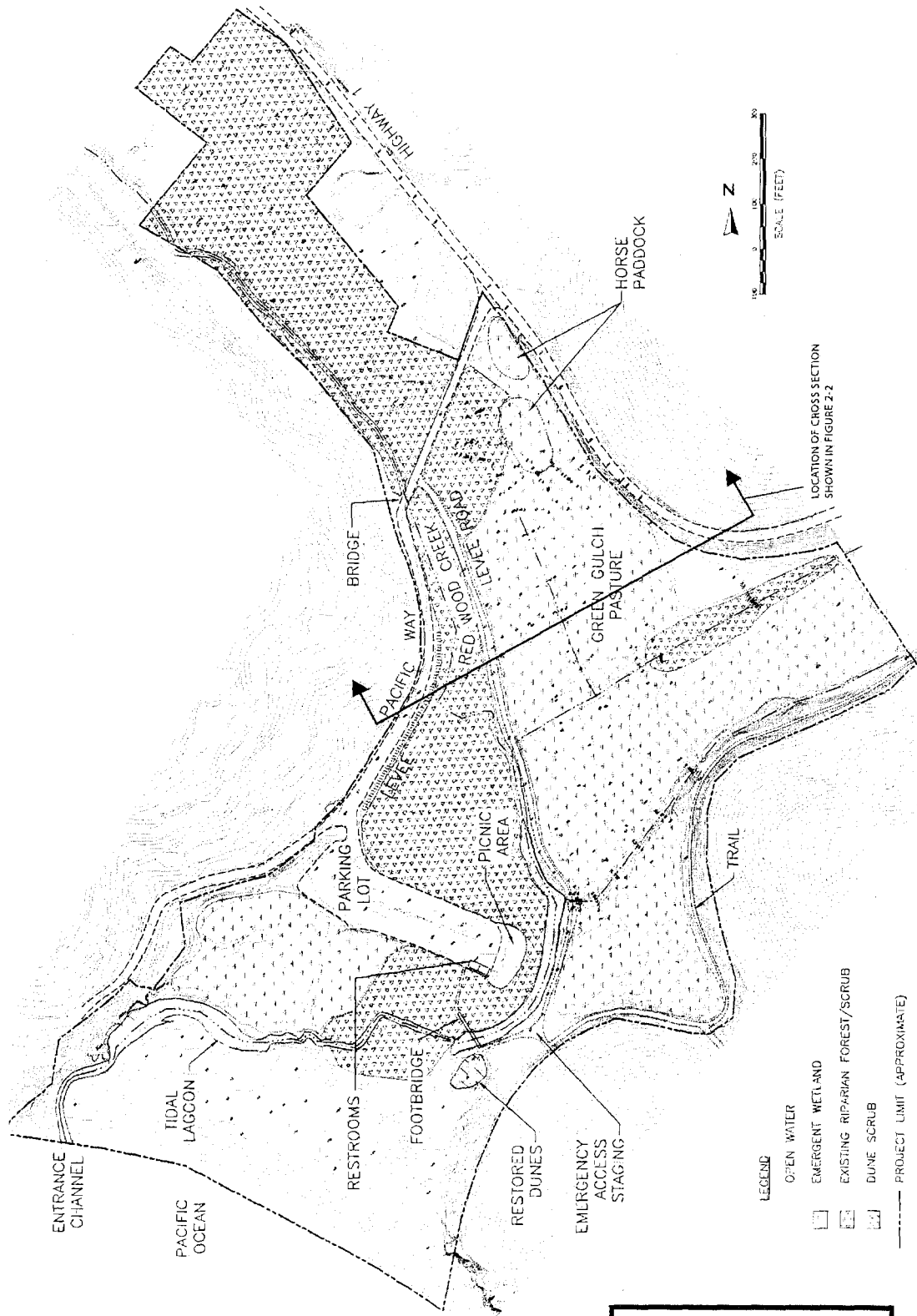


EXHIBIT NO. 3

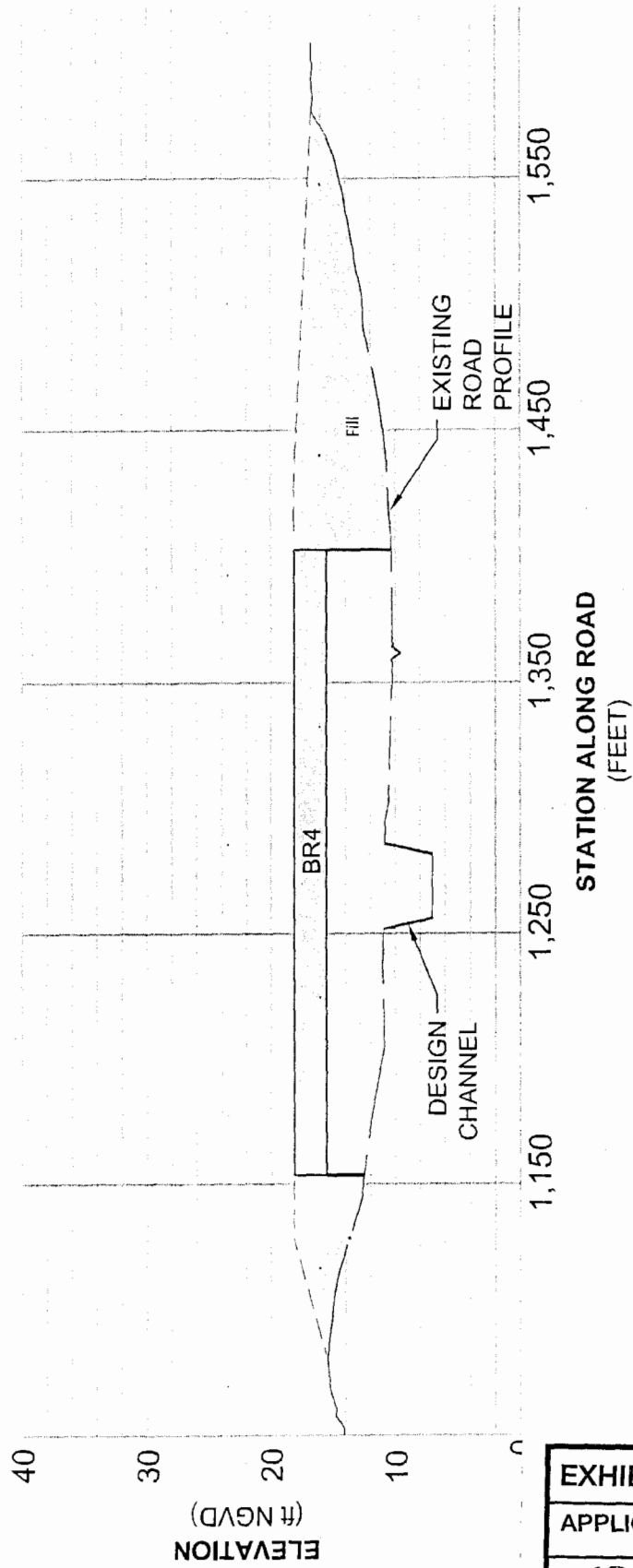
APPLICATION NO.

CD-14-08

Applicant: Golden Gate NRA
Coastal Consistency Determination

Figure 2 : Site Map - Existing Conditions

Wetland and Creek Restoration at Big Lagoon, Muir Beach, CA



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EXHIBIT NO.	4
APPLICATION NO.	CD-14-08

Note: Conceptual design. Does not show bridge supports

Applicant: Golden Gate NRA
Coastal Consistency Determination

Figure 6 : Pacific Way Bridge - Proposed

Figure 4d.

USFWS Wetland Habitat
Southern Project Area

Big Lagoon Wetland and Creek
Restoration Project Area,
Marin Beach, CA



Project Area Boundary

USFWS Cowardin Classification

Palustrine Emergent

Saturated, partially drained/ditched

Saturated, diked/unimpounded

Seasonally flooded

Seasonally flooded, diked/unimpounded

Seasonally flooded, partially drained/ditched, diked/unimpounded

Semi-permanently flooded, partially drained/ditched, diked/unimpounded

Intermittently exposed, partially drained/ditched, excavated

Palustrine Scrub-Shrub

Permanently flooded

Palustrine Scrub-Shrub/ Emergent Mix

Saturated, diked/unimpounded

Palustrine Unconsolidated Bottom

Seasonally flooded, partially drained/ditched

Riverine

Tidal, unconsolidated bottom, permanent tide

Lower estuarine, unconsolidated bottom, permanently flooded, diked/unimpounded

Estuarine

Subtidal, unconsolidated bottom

02SW42 Wetland Polygon Code

EXHIBIT NO. 5

APPLICATION NO.

CD-14-08

USFWS wetland habitat classified according to the Cowardin and Barbour Wetland Classification System of the United States (Cowardin et al. 1979). Wetland boundary information was derived from aerial photography and ground truthing data collected in 2002. Aerial photography from 2002 mapping and surveying January 2002.

Table 1. Summary of Excavation and Fill Quantities and Areas for Restoration Alternatives

	Restoration Alternatives (all units in cubic yards)		
	Alternative 2	Alternative 3	Alternative 4
Excavation Items (Areas shown for Alt 2, in Acres)			
New Main Channel			
a) Upstream of Pacific Way (0.48)	2,700	2,000	2,000
b) Downstream of Pacific Way (1.04)	4,400	3,200	600
c) Downstream of Footbridge (0.48)	1,500	1,600	1,600
New Green Gulch tributaries (0.2)	100	0	0
Backwater Channel ¹ (0.35)	5,000	0	0
Emergent Wetlands Excavation ² (1.58)	11,000	0	0
Lagoon Excavation(s)	0	101,100 ³	172,200 ⁴
Remove Levee Road (0.33)	2,500	2,500	2,500
Expand Backbeach Lagoon (0.46)	3,000	3,000	3,000
Remove Lower Parking Lot and Picnic Area (0.17)	1000	1000	1000
Total Excavation⁶	31,200	114,400	183,000
Total Area of Excavation⁶	5.09	8.93	12.48
Fill Items (Not including Parking Lot)			
New Creek Berms (0.07)	1,800	800	400
Fill Existing Main Channel (0.9)	2,000	2,500	2,500
Fill Existing Green Gulch tributaries (0.4)	600	0	0
Trails & Emergency Staging Area ⁵ (0.25)	1,400	1,400	1,400
Total Fill	4,800	4,700	4,300
Total Area of Fill	1.62	1.22	1.22
Net Excess Material	26,400	109,700	178,600

Notes:

¹ Includes extension of existing backwater channel and deepening the former main channel.² Excavation of wetland areas for Restoration Alternatives 3 and 4 are included under Lagoon Excavation.³ Total area for Alternative 3 lagoons is about 6 acres, with about 30,800 and 70,300 cubic yards excavation for the west and east lagoons, respectively.⁴ Total area for Alternative 4 lagoon is about 10 acres.⁵ Estimated fill volume for approximately 1,200-foot long trail. Actual trail length will vary depending on the Public Access Alternative.⁶ Comparisons are for primary restoration actions for each alternative. Detailed acreages : left column for Alternative 2, the preferred alternative.

EXHIBIT NO. 6
APPLICATION NO.
CD-14-08

Restoration Alternative 2, with its substantially smaller excavation and hauling quantities and reduced footprint of construction, would achieve long-term benefits similar to those of Alternatives 3 and 4 without the increased impacts associated with increased excavation, hauling and construction windows. Compared to Alternatives 3 and 4, Alternative 2 would have reduced impacts related to:

- the physical environment in terms of air quality (fewer construction-related dust and exhaust emissions);
- biological resources in terms of disturbance to on-site vegetation and wildlife communities;
- cultural resources in terms of potential disturbance of previously undiscovered cultural resources; and
- social resources in terms of reduced effects on recreation and visitor/resident experience during construction, including effects related to construction-related vehicle trips, aesthetics, and noise.

Restoration Alternative 2 as the Least Environmentally Damaging Alternative

Alternative 2 is the least environmentally damaging practicable alternative due to its benefits to the aquatic environment and, compared to Alternatives 3 and 4, its reduced impacts on the physical environment, biological resources, cultural resources and social resources.

3.2 Public Access Alternatives

The Final EIS/EIR evaluated five public access alternatives (see Figures 2-12 to 2-17 in the Final EIS/EIR). All alternatives were designed to minimize impacts on hydraulic processes while accommodating visitor access and parking at or near the beach. The public access alternatives all include a parking lot, a new picnic area, and a new pedestrian and multi-use trail adjacent to Pacific Way. The Public Access alternatives are:

- Alternative A: Existing parking lot, 175 cars at the beach
- Alternative B-1: 50-car-lot at the beach
- Alternative B-2: 145-car-lot at the beach
- Alternative B-3: 175-car-lot at the beach; parking lot is reconfigured with lower end removed, plus expansion into adjacent riparian area
- Alternative B-4: 175-car-lot at the beach; parking lot is rotated parallel to Pacific Way to substantially add conveyance area next to creek
- Alternative B-5: 200-car-lot at beach on reconfigured parking lot
- Alternative C: 118-car-lot adjacent to Hwy 1, just north of the Pelican Inn; pedestrian trail through alder grove from parking lot; transit turn-around and drop off at the beach.

EXHIBIT NO.	7
APPLICATION NO.	
CD-14-08	

Alternative B-4 is the preferred alternative, the environmentally preferable alternative identified in the Final EIS/EIR, and the least environmentally damaging practicable alternative. It is identified for all of these categories due to its combined benefits for traffic-related topics, such as parking and visitor experience, and ecological resources, particularly natural creek function. Each of these areas of impacts and benefits is discussed below for the alternatives.

Traffic and Parking Issues

Traffic and parking analyses were based on data from transportation studies conducted in 2003 as part of the Comprehensive Transportation Management Plan (CTMP) for southern Marin County. These studies showed that current demand for parking at Muir Beach on a peak season weekend exceeds existing capacity – or about 200 cars compared to the existing capacity of 175 cars (see Table 4.3.4.1-3 of the Final EIS/EIR). Projections show future demand increasing to about 260 parking spaces during peak season weekends and about 210 spaces on peak season weekdays. Under the existing condition, traffic backs up onto Pacific Way due to queuing in the parking lot, creating additional gridlock, reducing the quality of visitor experience, and contributing to frustrations among the adjacent residential community who also rely on Pacific Way for access to their homes.

Those public access alternatives with substantially reduced parking capacity (Alternatives B-1 and C) compared to the existing condition were found to cause significant major adverse and significant moderate adverse impacts on traffic, parking and visitor experience. Alternative C was found to have additional impacts on traffic safety and gridlock since a new turn-off would have to be constructed from Highway 1 and would create additional safety issues on Highway 1. Alternative B-2, with marginally reduced parking capacity to 145 cars, would not have as substantial an impact as B-1 or C, but it would nevertheless contribute to greater congestion and parking issues.

If the parking lot capacity were increased to more closely meet both existing and projected demand, as under Alternative B-5 with 200 spaces, some parking issues would be relieved, but the size of the parking lot would be increased substantially compared to the existing parking lot, thereby increasing wetland fill and contributing to an expansion of visitor amenities that detracts from the ecological value and rustic character of the site.

Therefore, in considering parking lot capacities, the two parking lot alternatives that retain the same capacity as the existing lot, Alternatives B-3 and B-4, were found to be most suitable in terms of minimizing adverse effects on parking, traffic, visitor experience, and residential experience. NPS considers it necessary to retain the existing capacity of the parking lot in order to avoid greater impacts for visitors and adjacent residents. Among the two alternatives with the same parking capacity, they are distinguished primarily by the benefits and impacts related to aquatic functions, as described below.

Ecological Issues

Creek Function

The fill pad for the existing parking lot and picnic area is about 3 to 4 feet higher than the natural floodplain elevation and extends about 500 feet across the floodplain at the mouth of Redwood Creek. It leaves about a 50-foot-wide cross-sectional area for high flows to pass to the ocean. This is an insufficient area for high flows and has caused an increase in upstream flood elevations, rapid sediment aggradation upstream, and a substantial loss in natural creek function.

Consulting hydrologists, Philip Williams and Associates, identified the maximum extent of all parking lot alternatives identified in the Draft and Final EIS/EIR to reduce impacts of the parking lot on flood elevations. Through the use of a hydraulic model, consultants showed that by removing the lower 90 feet of the existing parking lot, and thereby expanding the cross-sectional area available for high creek flows, the effect of the parking lot on flood elevations would be substantially reduced. Therefore, all restoration alternatives assume removal of at least the lower 90 feet of the parking lot. However, some parking lot alternatives would have greater benefits than others for reducing the effect on flood elevations.

The preferred alternative is the least environmentally damaging because it substantially expands the cross sectional area for high flows from the existing 50 feet to about 350 feet. Compared to Alternative B-3, which has comparable benefits for traffic and parking capacity, Alternative B-4 provides much greater leeway for the long-term function of natural aquatic and geomorphic processes during large magnitude events.

Alternative B-4 requires the initial loss of 0.87 acres of mature riparian habitat when the existing lot is rotated to be parallel to Pacific Way. However, the 0.79-acre area where the lower end of the existing lot is removed will be restored to riparian habitat and will be available for floodplain function, whereas the existing lot prevents natural floodplain function. (Note: a portion of the existing lot will remain in place.)

While smaller parking lots such as Alternatives B-1 and B-2 would also improve natural creek processes and would add jurisdictional wetland area to the site, they would not meet basic public access demand to this area. Alternative C-1, relocated upstream of Pacific Way with a new entrance from Hwy 1, would also improve natural creek processes, but would require placement of new fill in a densely vegetated and high quality wetland area. Further, it would expand the area of human impact, since a new trail would have to be constructed through the alder grove upstream of Pacific Way and fill for a drop-off area adjacent to the beach would still be needed. Neither Alternative B-1, B-2, nor C-1 would substantially improve the full range of environmental issues that B-4 would address. While fill footprints for Alternatives B-1, B-2 and C-2 are smaller than that of B-4, these alternatives fall short of adequately meeting the NPS need and project objective to accommodate parking and provide public access – and in fact, would contribute to adverse traffic conditions.

Parking Lot Areas

The total area and quantities of excavation and fill placement for each parking lot alternative are shown below in Table 2. All parking lots will have new wetland swales between rows of parking stalls to create a filtration system for runoff.

Table 2. Area and Quantities of Excavation and Placement for Parking Lot Alternatives

Public Access Component (Parking)	No. of Parking Spaces	Total Area (Sq. Ft.)	Excavation /Placement Quantities (CY)	Net Excess (CY)	Area of New Wetland Swales (sq. ft.)
Alternative A – Existing Lot	175	63,000			0
Alternative B1 – Small lot at Beach	50	23,510	3,500/700	2,800	1,485
Alternative B2 – Shorten Existing Lot at Beach	145	49,175	0/700 **	(700)	3,000 (approximate)
Alternative B3 – Shorten and Widen Existing Lot at Beach	175	63,640	0/2,100 **	(2,100)	3,845
Alternative B4 – Rotate Lot Parallel to Pacific Way	175	71,445	2,900/5,700	(2,800)	3,910
Alternative B5 Rotate and Expand Lot at Beach	200	87,418	0/8,600**	(8,600)	13,080
Alternative C – New Lot at Alder Grove adjacent to Hwy 1	118	41,800 at alder grove; 20,805 at turn-around; 62,605 total	3,800/7000	(3,200)	3,275

** Excavation quantities for Alternatives B-2, B-3 and B-5 are shown as zero cubic yards because the excavation estimates for restoration alternatives incorporate the volume removed from the lower end of the parking lot.

Alternative B-4 entails a new parking lot that is slightly larger than the existing parking lot – 71,445 sq. ft (1.64 acre) compared to the existing 63,000 sq. ft (1.45 acre). The larger area is primarily due to a 2,900 feet for a new entrance to the parking lot that have “stacking room,” or an area where up to 15 cars will queue while waiting for a parking space. With stacking room,

the parking lot will be able to absorb some of the impact of overflow traffic, thereby reducing congestion on Pacific Way, which is used by residents and emergency vehicles.

The slightly larger area for the preferred parking lot will be more than offset by the substantially improved natural function of the creek and wetland system. The area where the existing parking lot is removed will be graded to a natural floodplain elevation available for overbank flow under about a 1 year event, and the area will be restored to a natural wetland and floodplain with native vegetation. With an expansion of the floodplain adjacent to the creek from 50 feet to 350 feet, created by rotating the parking lot, flood flows will not be constricted, sediment will be transported more effectively, natural geomorphic modifications can occur during large events, and there will be active annual floodplain for salmonids adjacent to the creek.

While the preferred alternative will increase wetland fill for the parking lot alone by about 0.19 acre, the gains in wetland function due to restoration activities will offset this impact. (See Table 1 of Attachment A, revised January 2008, for a detailed list of excavation and fill areas in wetlands under the preferred alternatives for restoration, public access and the bridge.)

Additional Activities for the Public Access Alternatives

All public access alternatives include two other features in addition to a reconfigured or relocated parking lot – a new pedestrian trail adjacent to Pacific Way and a relocated picnic area. These features are described below.

- **New Pedestrian Trail.** The new pedestrian trail would extend 1,200 linear feet from Highway 1 to the parking lot. It would be adjacent to Pacific Way and be a multi-use trail. One reach of the trail would adjoin the new Pacific Way Bridge. The trail would be 5 feet wide, except on the bridge, where it would be 6 feet wide. It would fully meet ADA requirements.

The portion of the trail between the bridge and the parking lot would be built on the bank of the existing channel alignment, which would be filled as part of the restoration activities since the channel will have a new alignment. The fill placed in the existing channel could be placed at shallow depths so as to support wetland vegetation. A portion of the fill placed to create the new path is not expected to be placed in jurisdictional wetland, but conservative estimates are used in this analysis that assume the whole area for the trail is within jurisdictional boundaries, or a total of 0.25 acre. Access to Muir Beach from the parking lot will be by bridge and a new extended boardwalk, much as in the existing condition.

- **Picnic Area** – The existing fill pad that functions as a picnic area adjacent to Redwood Creek will be removed and relocated adjacent to the new parking lot. While it is currently not designed, the Final EIS/EIR identified its total size as slightly smaller than the existing picnic area – or 0.13 acres compared to the existing 0.17 acres. It will accommodate about 10 picnic tables and will be ADA accessible. The size of the picnic area will be slightly reduced in order to partially offset fill placement from other public access actions.

These features are components of the preferred public access alternative, B-4, as well as all other alternatives. The pedestrian path will meet a need for an enhanced visitor experience and will reduce conflicts between pedestrians and vehicles which currently slow traffic on Pacific Way. It will also help connect a network of regional trails, such as a new alignment of the Dias Ridge trail which is proposed in a separate NPS project to be realigned from Panoramic Highway to terminate at Muir Beach east of Highway 1. Compared to the existing alignment of the levee road, which currently provides pedestrian access to the Coastal Trail and bisects the natural area of the site, the new pedestrian path will keep human access areas on the periphery of the site, thereby reducing impacts of human use on natural function.

Other Alternatives for the Parking Lot

In an effort to identify the least environmentally damaging practicable alternative for a parking lot to accommodate visitors to the site, NPS evaluated a wide range of possibilities. Possible locations for off-site lots were identified, and their environmental and traffic-related impacts were considered.

The following Public Access Alternatives were considered but rejected from further analysis in the Final EIS/EIR, as explained below:

- Parking Lot on Green Gulch Property. A parking lot on Green Gulch Farm property adjacent to the project area is not proposed because the San Francisco Zen Center Board of Directors, as property owner, opposed use of their land for this purpose. In addition, the area that was considered is also likely to be jurisdictional. If a parking lot were constructed at that location, it would obstruct wetland processes at the base of a subwatershed and also require the construction of a road through a jurisdictional area at the edge of the project area.
- Remote Parking Lot. Construction of a remote parking lot, such as one at the Old Ballfield, at the intersection of Hwy 1 and Muir Woods Road (about ½ mile from the project site), would create public safety hazards as pedestrians attempt to cross Hwy 1, and would impair public access to the popular site to a significant degree, which is inconsistent with NPS goals for the site. Furthermore, the Old Ballfield site is a natural 7-acre floodplain to Redwood Creek that could be restored as floodplain if infrastructure is not constructed there.
- Dual Parking Lots. Provision of two parking lots, such as one at the Alder Grove and one in the general vicinity of the existing parking lot, was not considered due to the potential for increased traffic congestion as drivers circulate between lots looking for parking places.
- Shrinking Parking Lots. Parking lots that would be designed to shrink as public transit use rises were not considered because demand for personal vehicle parking is expected to remain at current levels or increase, regardless of increased public transit opportunities. However, if public transit opportunities become available and parking demand declines after project implementation, NPS could take separate actions at that time to reduce the size of the parking lot.

- Alternative Transportation. Limited public transit access is already provided to the site. Planning and provision of more accessible and visitor-friendly public transportation into the future is beyond the scope of this project. New modes of public transportation to this and nearby recreational sites were considered through the CTMP project in 2003 and 2004, but the CTMP project is no longer engaged in active planning. However, Marin County is currently working with Caltrans to plan a transit stop at the intersection of Hwy 1 and Pacific Way.
- Separate Access Road. Provision of a separate access road adjacent to Pacific Way for Muir Beach visitors was not considered further due to the potential for additional environmental impacts associated with construction and use of such a road. Construction of an additional road would likely result in a net loss of wetland acreage under the terms of the Corps.
- Street-Side Parking. Providing street-side parking along Pacific Way or Hwy 1 is not being considered because it would increase the footprint of the roadways, with potential for additional environmental impacts associated with construction and use of such parking. It would also raise safety and traffic congestion issues along these roadways as vehicles are parking and visitors wait for parking spaces to open.

Additional on-site locations were also evaluated as possibilities. However, most of the site (26 of 38 acres) is jurisdictional under Section 404, and virtually no upland area is available for parking lot relocation. Furthermore, the position of the parking lot in relation to the creek and the need to maximize its available floodplain further limit the possibilities. NPS considered the possibility of relocating the parking lot to the corner of Highway 1 and Pacific Way; however, in this case, the parking lot would be less than 100 feet from the creek alignment, restricting floodplain function. To the south of the project area, the landscape is hilly and impractical for location of a parking lot.

Based on this review of other alternatives, there are no other less environmentally damaging practicable alternatives for a parking lot than those considered in the Final EIS/EIR.

Public Access Alternative B4 as the Least Environmentally Damaging Alternative

Public access Alternative B-4 is the least environmentally damaging practicable alternative because it avoids adverse impacts from traffic congestion and parking deficits which would negatively impact visitor experience and access to the coastal site. At the same time, this alternative substantially improves natural creek functions. In addition, it avoids the adverse effects to aesthetics and biological resources of the larger lot and the remote lot. Its greater distance from the creek than Alternative B-3, which also retained the same parking capacity as the existing parking lot, provides much greater leeway for natural floodplain and geomorphic processes during large storm events. Its overall size, together with other public access components of the picnic area and pedestrian path, is slightly larger than the existing footprint of public access facilities, but this is offset both by the substantially improved natural function of a critical reach of Redwood Creek.

3.3 Bridge Alternatives

The Final EIS/EIR identified three alternatives for a new Pacific Way Bridge. A new bridge is needed because the Redwood Creek channel will be relocated and because Pacific Way Road spans a natural floodplain that currently floods during routine winter events. The existing bridge obstructs flow conveyance and sediment transport, causing the existing channel to aggrade.

The three bridge alternatives and the existing bridge (Alternative BR1) are shown in Table 3 (also shown as Table 2-4 in the Final EIS/EIR):

Table 3. Bridge Alternative Characteristics

Bridge Alternative	Bridge Deck Height (feet NGVD)	Bridge Span (feet)	Road Elevation (feet NGVD)	Estimated Volume of Soil to Raise Road (cubic yards)
BR0 (No Action)	15.2	24	~11 to 15.2	n/a
BR1	16.5	50	15.5 to 16.5	2,000
BR2	15.0	50	~11 to 15	400
BR3	16.25	150	15.5 to 16.25	1,000
BR4	~16.25 to 18.0	250	~15 to 18	1,110

The bridge alternatives are differentiated primarily by the length of the span in the 300-foot-long reach of PacificWay that traverses an active floodplain between the driveway to the Pelican Inn and the existing bridge. In all alternatives, the bridge would be a maximum of 32 feet wide, including two vehicle lanes (each either 10 or 11 feet wide), a 1-foot-wide shoulder on each side and a 6-foot-wide pedestrian path. Alternatives have a range of deck heights; the higher the deck, the larger the magnitude of the storm event in which the bridge will remain passable. BR-4 will provide vehicular access during the largest storm events, expected to be as close as possible to the 100-year storm event, whereas BR-3 would be overtopped by a few inches of water during a 10-year storm event.

In Alternatives BR-1, BR-3 and BR-4, the bridge span would be adjoined by a raised road on either end to provide vehicular access across the floodplain. The longer the bridge span is, the less the length of road to be raised and the greater the area of floodplain that is connected under the bridge. Alternative BR-2 would also have a 50-foot long span, but the remaining 250 feet of road would not be raised, although this would leave the road vulnerable to overbank flow during large events.

Where the road is raised, a new embankment would also be extended about 10 feet to the side. The road approach is assumed to have a slightly wider road than the existing road - 25 rather than 20 feet. Assuming a 25 foot-wide road, with 3:1 side slopes, resulting in a total footprint of approximately 40–50 feet, the length of the raised approaches and the total footprint of the road embankment varies by alternatives. Shorter spans result in larger footprints for the road embankment and larger areas of fill placement. Longer spans result in larger areas of existing

roadway removed and restored to native floodplain substrate. Table 4 compares areas of fill removed and placed for BR-3 and BR-4.

Table 4: Area of Fill Removed and Placed for Bridge Alternatives BR-3 and BR-4

Action	Area – BR-3 (Acres)	Area – BR-4 (Acres)
Remove road from wetlands where longer bridge will be built	+ 0.07	+ 0.11
Bridge footings (about 2 x 36 ft), plus possible adjacent reinforcement	- 0.005	- 0.007
Raise road and extend footprint of Pacific Way Road out 10 feet on each side due to 3:1 slopes for embankment from higher road	- 0.07	- 0.05

A comparison of the beneficial and adverse effects of each bridge alternative is shown in Table 2-8 of the Final EIS/EIR and is attached to this analysis. Bridge alternatives were analyzed for impacts related to flooding, traffic accessibility, upstream-downstream floodplain connectivity, long-term channel function, fish passage condition, and construction impacts. Construction-related effects are anticipated to be similar among all the Bridge Alternatives. The bridge replacement would involve removal of many trees that line Pacific Way to allow clearance for construction.

Alternative BR-4 as the Least Environmentally Damaging Alternative

Bridge Alternative BR4 is the least environmentally damaging alternative because it would not only allow for the greatest level of all-weather vehicular access, but because it would span the entire floodplain. It would allow for improved natural function of the creek and floodplain by allowing for channel migration and floodplain connectivity and improved fish passage for the resident salmonids. Also, due to the longer span, less fill will be placed to raise the road at either end of the bridge.

BR-4 was selected as the preferred bridge alternative despite its higher cost (\$4.4 million compared to \$3.5 million for BR-3 or \$1.5 million for BR-2) due to its environmentally superior benefits, particularly in relation to long-term channel function. The raised road in Alternatives BR-1 and BR-3 would likely obstruct sediment transport and flows during large events, thereby impacting natural processes and increasing the possibility that mechanical sediment removal could be necessary for channel maintenance. At 250 feet long, BR-4 is the longest possible bridge and represents the best option to meet the project purpose of creating a sustainable, self-sustaining aquatic system while also accommodating vehicular access.

4.0 CONCLUSION

Each of the proposed alternatives for restoration, public access and a new Pacific Way Bridge is the least environmentally damaging practicable alternative. This set of preferred alternatives minimizes impacts to Clean Water Act jurisdictional areas while improving natural aquatic function, providing public and residential access to this popular coastal site, and minimizing other environmental impacts such as traffic congestion and impacts of hauling.

Functioning together, the combined benefits of the preferred restoration, public access and bridge alternatives exceed their individual benefits because they will collectively create an integrated aquatic habitat over the entire 38-acre project site and improve the long-term function of Redwood Creek.

with representatives of regulatory agencies. Input from these meetings was used to refine the restoration, public access and bridge alternatives before the EIS analysis was initiated in 2004 (Final EIS/EIR, p. 7-1). Numerous locations, configurations and sizes of parking lots were considered during the preparation of conceptual alternatives that were not carried forward into the EIS/EIR analysis (Final EIS/EIR, p. 2-42.)

Preferred Alternative

The Final EIS/EIR identifies a preferred restoration, public access and bridge alternative (Figure 5), as described below.

- The preferred restoration alternative entails realignment of the creek to a natural topographic location, along with levee removal, associated riparian habitat restoration and creation of two new emergent wetlands to provide suitable breeding habitat for the California red-legged frog.
- The preferred public access alternative entails rotating the visitor parking lot to reduce its hydraulic impacts, but it will retain the existing parking capacity of 175 cars. A new multi-use trail will extend from Hwy 1 to the parking lot, providing new links to other proposed trail and shuttle links converging at the intersection of Hwy 1 and Pacific Way.
- The preferred bridge alternative is the longest feasible bridge, a 250-foot-long bridge over the newly relocated channel and adjacent floodplain, with a raised road approach.

The restoration actions focus on reconstructing natural geomorphology and function at the Big Lagoon site. The public access actions are designed to emphasize a reduction in hydraulic impacts, while improving public access to a functionally and visually restored Big Lagoon site. The preferred Pacific Way Bridge alternative, the longest feasible bridge, maximizes both natural channel function and vehicular access during storm events.

Marin County's role in this project pertains to actions related to the Pacific Way road and bridge, with a joint role for interim flood reduction. All other actions are the responsibility of NPS.

More details about the preferred alternatives are provided below.

Project Benefits

While benefits and impacts of the restoration, public access, and bridge alternatives are analyzed separately in the Final EIS/EIR, the greatest benefits will occur from the combination of these three project components. Each component addresses a particular disruption of natural creek processes that have degraded a riverine system that historically sustained healthy salmonid fish populations and offered high quality wetland and wildlife habitat, while distributing and conveying large quantities of sediment and high stormwater flows. The combined benefit of the preferred alternative creek realignment, parking lot reconfiguration, and the Pacific Way Bridge will create the most unobstructed floodplain in the project area since about the 1920s. All components functioning together will improve flow conveyance, sediment transport, floodplain function and habitat value for

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salmonids and frogs, while also improving vehicular access and maintaining visitor and residential access in a manner that is the least environmentally damaging, practicable alternative.

Proposed Creek and Wetland Restoration Actions

Channel Modifications

NPS proposes to relocate a total of approximately 2,500 linear feet of creek channel to the topographically lowest location in what will be a substantially broader active floodplain (Figure 5). This will occur in two segments, one 1,800-linear foot reach in the upper half of the project area, and the second, downstream of the parking lot (about 550 feet) connecting to the tidal lagoon. The tidal lagoon will also be enlarged through excavation. Both the lower channel relocation and the excavation associated with enlarging the tidal lagoon will connect to and become navigable waters subject to Section 10 of the Rivers and Harbors Act. The upper extent of Section 10 jurisdiction is at the elevation of 2.5 feet NGVD.

The Redwood Creek channel from the upstream project boundary to approximately 100 feet downstream of Pacific Way would be relocated approximately 100–200 feet to the northeast of its existing alignment. The proposed location of the new channel would generally follow the topographically lowest portion of the valley, minimizing the potential for channel avulsion. This low point is approximately 150 feet from the Pelican Inn driveway at Pacific Way.

The main excavated channel will be constructed approximately 35 feet wide and about 5 feet deep. Log structures will be installed downstream of Pacific Way to encourage development of natural habitat features for resident salmonids, and rock gabions along about 150 feet of the left bank just upstream of the pedestrian footbridge would be removed. Natural dynamic processes over time will carve a more natural appearance as the substrate and flowing channel seek a new equilibrium. Low sloping berms will be constructed to re-create the natural depositional levees with gently sloping banks on both sides of the channel and will retain wetland characteristics. These low berms would confine bankfull (Q1.5–2) flows upstream of Pacific Way and slightly smaller flows (Q1) downstream of Pacific Way. The lower 400 feet of the channel downstream of Pacific Way, near the confluence of the channel with the existing alignment, will have either discontinuous or no berms at all in order to provide floodplain connection under an annual flow event. The berms would support riparian vegetation that would help maintain the channel form, increasing sediment transport and channel sustainability. They are expected to still support wetlands. The channel capacity is lower downstream of Pacific Way in order to provide frequent overbank flow that provides floodplain habitat for salmonids.

Much of the existing channel will remain in place to function as a backwater habitat for use by salmonids and to increase flood storage capacity. Backwaters will be connected upstream of Pacific Way by excavating two new connections with the relocated channel, and a new backwater area will be excavated where the existing levee will be removed, adding about 0.55 acres of new open water. The grade adjacent to the new backwater will be lowered slightly to encourage extended floodplain habitat during the winter season. About four subreaches of the existing channel will be backfilled once the new channel alignment is constructed. These include a portion of the channel at the upstream end of the project area, the channel just upstream of the Pacific Way Bridge, the channel

alignment downstream of the bridge and adjacent to the road, and a channel segment downstream of the pedestrian footbridge to the beach. It is possible that the channel downstream of the pedestrian footbridge will not need to be realigned; in this case, this portion of the channel would continue to serve as the mainstem channel rather than backwater habitat. Fill placed in portions of the existing channel will require approx. 2,000 cy of fill material (freshly excavated substrate), and will fill approximately 1,520 linear feet of channel, about 0.9 acres. This fill placement is expected to still support wetlands.

Emergent Wetlands for California Red-Legged Frog Habitat

The channel modifications will restore a more natural gradient and thalweg to the creek and will cause groundwater elevations in the pasture area to drop by about 1 foot to elevations measured in the early 1990's. Under the existing condition, groundwater elevations have risen as the confined creekbed aggraded due to sediment deposition. To maintain ponded water and emergent vegetation for the California red-legged frog (CRLF), NPS proposes to excavate two ponds deep enough to be sustained by groundwater and support emergent vegetation (Figure 5). The creation of the two ponds, totaling 1.58 acres of emergent wetland, will require the excavation of approximately 11,000 cubic yards of substrate in the wetland pasture. The banks of the ponds will be gently sloped to a depth of about 4 feet below the surface.

Excavation or other construction activities in existing aquatic habitat would only be performed between the dry season of August 1-October 31, or at least before the onset of the rainy season, for protection of frogs and to ensure that actions are conducted outside of both breeding and tadpole rearing season. Excavation is not proposed through the existing cattail habitat in the southernmost portion of the pasture where frogs have typically been located during breeding season.

Actions in Green Gulch Pasture

The naturally lowered groundwater elevation will encourage a shift in the project area from emergent marsh to wetland riparian vegetation. Much of the area currently supporting cattails may slowly shift to cover by willows or alders due to the approximate 1-foot-drop in groundwater elevation. However, the area is expected to be inundated annually and will still be a low gradient area that is expected to remain wet during most winters. Even with a shift to dominance by riparian vegetation, the area is still expected to remain a wetland.

The existing 1,300-linear foot levee that confines the creek floodplain and defines the boundary between NPS land and San Francisco Zen Center property would be removed completely, and with it, two culverts that convey the flows from the two Green Gulch tributaries, converting about 0.33 acres of upland to wetland. A portion of the levee will be excavated to become a new backwater attached to the existing channel that will also function as a backwater once the new channel is constructed. The levee will function for equipment access during the construction period and will be removed once actions in the pasture area are completed. Concrete lining in the southern Green Gulch tributary will be removed in the project area and the two drainages will be slightly rerouted and reconnected with the Redwood Creek channel at a single location that minimizes construction activity in the existing red-legged frog habitat. Some of the lower reaches of the northern Green Gulch tributary, an area of about 0.4 acres, will be backfilled after the new tributary alignment is constructed, but this area is expected to be retained as wetland.

Currently, the levee serves as the emergency access route to the Coastal Trail south of Muir Beach. To remove the levee, a new emergency access route will be established along an existing road and trail around the perimeter of the site on the San Francisco Zen Center property. This route was originally constructed to be about 11 feet wide, but overgrown vegetation at its edges will be removed to restore this minimum width for emergency vehicles. Fill will not be placed to upgrade the emergency route, but a crossing over the southern Green Gulch tributary will need to be enhanced and may entail placement of a minimum quantity of fill for this purpose (less than 0.001 acres).

A new drainage swale is proposed downstream of Pacific Way in the Green Gulch pasture between the realigned creek channel and the eastern project boundary. The purpose of the swale would be to collect runoff that would otherwise gather at the base of the eastern berm of the realigned creek. The swale would be very gradually sloped and approximately 1–2 feet deep. It would flow into one of the new ponds constructed to support emergent vegetation and then connect to the realigned Green Gulch tributary. This action will be taken in existing wetland and is not expected to expand or cause the loss of wetlands.

The project boundary includes the lower third of Green Gulch Field 7, where four horses are currently in pasture under an agreement with the San Francisco Zen Center. Fencing around the perimeter of Field 7 will be adjusted to reflect the new project boundary. An existing horse shelter and associated fill pad in the lower portion of the field would be removed and relocated outside of the project boundary. These actions are expected to result in an equivalent amount of wetland creation and wetland fill (about 0.005 acres). The boundary adjustment for Field 7 would likely lead to the loss of one of Ocean Rider's horses in Field 7. The windrow of Monterey cypress trees on the southwest edge of the field would be removed. Some of these tree trunks may be large enough for reuse as large woody debris in the newly relocated channel.

Expansion of Intermittent Tidal Lagoon and Enhancement of Adjacent Wetlands

Excavation is proposed along the landward side of the intermittent tidal lagoon to enhance its natural variability (Figure 5). An approximately 100-foot wide swath would be excavated along the entire 200-foot length of the north side of the lagoon. The excavation depth would be as much as 4 feet, or somewhat deeper than the roots of the existing vegetation, dominated by salt tolerant species such as salt grass (*Distichlis spicata*) and rush (*Juncus lesurii*). The excavation would expand the open water lagoon by up to about 0.46 acres, but it is expected to vary in size seasonally and as a result of interannual variation in flows and sediment loads. Wave action and inundation by lagoon water would discourage vegetation establishment, allowing windblown sand to reconstruct the historic dune field. Large log structures are also proposed to be installed in the tidal lagoon to create scour pools and cover favored by coho salmon in such habitats.

A portion of the wetland area between the existing parking lot and the intermittent tidal lagoon has a surface layer of fill that supports a virtual monoculture of the highly noxious kikuyu grass. About 1 acre of fill will be excavated to just below the rooting depth of the kikuyu grass (about 1 foot) to allow this area to return to a cover by native wetland vegetation. This area is already wetland, and wetland acreage will not be increased by this action, but function will be enhanced. However, some geomorphologists predict this area will eventually become dunes due to windblown sand. If so, this

loss of wetland acreage is considered a natural event and is not included in overall changes in wetland acreages at the site.

Some remnants of the non-historic Muir Beach Tavern in this area adjacent to the existing parking lot would also be removed to enhance the natural wetland function (Figure 5). The remnants include the concrete sidewalks, and a concrete retaining wall or curb along the northern side of the mouth of Redwood Creek. Remnants of the tavern chimney would not be removed. Heavy equipment would be used to remove these features, and ground contours restored to match those of surrounding floodplain. Up to about 0.01 acres of wetland would be gained by this action.

Proposed Public Access Actions

Reconfigured Parking Lot

The new preferred alternative for public access identified in the Final EIS/EIR is Alternative B-4 (Figure 6). Under this alternative, the parking lot will be rotated east-west and parallel to Pacific Way. Its capacity will be the same as the existing lot, 175 parked cars. It would include a new entrance from Pacific Way and 310 linear feet of stacking room for cars between the entrance and the first parking stall. The southern end of the existing parking lot and picnic area (about 0.73 acre) would be removed, creating a distance of about 350 feet from the bank of Redwood Creek and substantially expanding the floodplain area available for conveyance of high flows and sediment to the ocean. The reconstructed parking lot will occupy about 0.93 acre, 0.2 acres more than the existing lot (71,445 sq. ft. compared to 63,000 for the existing lot.) It will extend further northward into mature riparian habitat and will entail removing about 2,700 cubic yards (CY) of fill and placing about 5,700 CY.

Reconfigured Picnic Area

The existing picnic area, totaling about 7,375 sq. ft. (0.17 acre), will be relocated adjacent to the newly reconfigured parking lot. It is expected to be between about 3,500 and 5,500 square feet (up to about 0.13 acre), or up to about 75% of its current size, allowing a gain of about 0.04 acres in wetlands. The picnic area will be large enough to accommodate about 10 picnic tables, with sufficient room for school groups, hiking groups and others that often gather in the area. A conceptual layout or design for the picnic area has not been prepared, but it will meet a range of guidelines identified in the Final EIS/EIR. It will be relocated to maximize the floodplain width for flow conveyance. This relocation will entail the placement of new fill in existing wetland area. It will be located at a distance from the local residences to minimize noise and other disturbances. Trash cans must be easily accessible to maintenance vehicles so the picnic area will be linked to the parking lot. The design will follow all requirements for Americans with Disabilities Act (ADA) accessibility, including offering ADA-accessible picnic tables. The existing size of the picnic area cited here includes about 4,275 sq. ft. removed by NPS in 2005 to reduce the impact of the fill pad on creek flows.

New vault toilets will be constructed adjacent to the parking lot pad. The new accessible toilets will be constructed in a location to minimize impacts to visual, natural and cultural resources as well as to adjacent residences and other visitor uses. While installation entails excavation to construct and

place the facility, the area affected is expected to be within the footprint of the newly relocated parking lot and will not add to the total area of wetland fill.

Trail Access from Highway 1

The preferred alternative for visitor access includes the construction of a new pedestrian trail along Pacific Way from Highway 1 to the beach parking lot. The 1,200 foot-long trail would be about 5 feet wide, except where it is attached to the new Pacific Way Bridge where it would widen to 6 feet. The segment of the trail closest to Highway 1 would be built atop a new embankment on the south side of Pacific Way (see a description of this embankment below). The segment of the trail closest to the parking lot would be built atop fill newly placed over the existing creek channel. About 0.25 acres of fill in existing wetland would be placed to create this new trail. This total includes the area of the road embankment on the south side of Pacific Way (about 0.035 acres) that would be filled anyway when the elevation of the road is raised.

This trail would provide multi-use access. A shuttle stop planned in a separate project by Marin County and Caltrans at Highway 1 and Pacific Way will connect with this new trail to create opportunities to visit the beach without the use of a car. The trail will connect with a new, proposed alignment of the Dias Ridge trail on the opposite side of Highway 1 and will create access for bikers and pedestrians from Panoramic Highway without having to travel down Highway 1. The trail along Pacific Way will lead to the beach and to the Coastal Trail on the south side of the project area.

Most of the Monterey pines that line the east side of Pacific Way would remain, although the pine that is at the corner of Pacific Way and Highway 1 may need to be removed for the pedestrian trail and two pines may need to be removed to create the new entrance to the parking lot. The new trail between the existing bridge and the parking lot would be separated from the road by a 5-foot wide buffer, and could also be grade-separated from the road by approximately 1 foot. The surface, width and slopes of the trail would meet ADA standards.

Pedestrian Access to Beach

A new pedestrian boardwalk and bridge crossing of the creek channel would extend from the new parking lot to the beach. The existing bridge and boardwalk will be replaced, but the exact locations of the boardwalk and bridge have not been determined at this time; final location and design characteristics would be defined in project design with a performance standard of minimizing adverse impacts to channel form, hydraulic processes, habitat and providing a quality visitor experience. The boardwalk and bridge would likely be placed above the plane of Mean High Water and not require the discharge of fill material. As such, it would not be considered a regulated activity.

For the purposes of illustrating the boardwalk and bridge, each public access alternative analyzed in the Final EIS/EIR shows one of two options for location. The two options presented represent the limits within which the boardwalk and bridge would be located. The first option shown is a boardwalk originating from the parking lot/drop-off and extending seaward across the wetland and tidal lagoon. The second option shown is a boardwalk originating from the parking lot/drop-off and extending in the direction of the existing pedestrian footbridge over the creek. Under the second option, visitors would continue through the dunes to reach the beach.

Proposed New Pacific Way Bridge

The preferred bridge alternative identified in the Final EIS/EIR is Alternative BR-4, the longest possible bridge. The bridge would be constructed by Marin County over the newly relocated channel and its adjacent floodplain between the Pelican Inn and the existing bridge. The bridge will span 250 feet, have a raised road approach at either end, and will connect smoothly to the Pelican Inn parking lot (Figure 6). The existing bridge on Pacific Way will remain functional during construction.

The bridge will be between 16.25 and 18 feet NGVD, compared to the elevation of Hwy 1 at 16.5 feet NGVD. The width of the new road and bridge will not exceed 32 feet and includes two vehicle lanes (each either 10 or 11 feet wide), a 1-foot-wide shoulder on each side and a 6-foot-wide pedestrian path. It is assumed that 2-foot wide piers will be placed at approximately 40-foot intervals to support the span. Rock slope protection will likely be applied at the bridge abutments. This part of the project will involve removing many riparian trees that line the road, to facilitate construction. The proposed road approaching the span will be up to 25 feet wide, with 3:1 side slopes.

The new bridge would provide access for residents and visitors during a very large magnitude event (i.e., much larger than a 10-year event and as close as possible to a 100-year event). Because it is the longest feasible bridge, spanning the entire floodplain, it will allow for improved natural function at the site by allowing for channel migration, floodplain connectivity and fish passage. It would have some benefits for reducing upstream flood elevations during moderate flow events, but not during very large events.

The 250-foot-long segment of Pacific Way that will be removed for the new span of the bridge will return about 0.11 acres of upland to wetland. It is estimated that about 3,300 cy will be used to raise the elevation of Pacific Way at either end of the bridge, a portion of which will be discharge into adjacent wetlands (about 0.05 acres).

Other Actions

Conservation Easement of Green Gulch Land

NPS will purchase a conservation easement for about 14.2 acres in the project area which are currently owned by the San Francisco Zen Center (SFZC), which operates Green Gulch Farm, a Soto Zen Buddhist community and working organic farm. The easement would protect the land in perpetuity, allow implementation of the project, and long-term park management.

The 14.2 acres at the project site consists primarily of the former pasture area between Highway 1 and the levee road, now dominated by seasonal and emergent wetland vegetation. This area was grazed by horses until the mid-1990's, but it has long been too wet for grazing or active agriculture. The SFZC land in the project area also includes the lower third, or about 1 acre, of a fenced field, known as Field 7, which the SFZC rents to a local equestrian operation, Ocean Riders, to pasture four horses. Space for one horse may be lost as a result of the project, but Ocean Riders has also indicated an interest in modifying their management practices to retain four horses on Field 7.

Two drainages from the Green Gulch subwatershed flow into the project area. The more northerly drainage is the Green Gulch Tributary, which was relocated and channelized in the 1960's, flows

through a culvert under the levee road to a secondary branch of Redwood Creek. The more southerly drainage, which is unnamed, is also channelized and has a concrete-lining in the upper portion of the project area. It flows through a topographically low area of the pasture where California red-legged frogs have been known to breed. A culvert under the levee road at its outlet was replaced by NPS in 2002 as part of flood reduction actions because it was collapsed and heavily silted. In 2003, however, in order to better retain ponding in the field for the frogs, NPS replaced the culvert with a flashboard weir structure which allows high flows to pass but can help pond water at other times. Both of these drainages will be rerouted into a more natural pattern. Concrete will be removed. The tributary flows will no longer pass under a culvert to Redwood Creek.

The farm has an appropriative state water right for 47 acre-feet to be withdrawn annually between April 15 and September 30. The point of diversion is on Redwood Creek in the project site, adjacent to the southern end of the levee road where a PG&E power pole is located and once supplied electricity for the water diversion pump. This diversion has not been used since 1989. Prior farmers reported it was subject to salt water intrusion during high tides. As part of the agreement between SFZC and NPS, the water right will be abandoned either in fact or in effect in order to protect instream flows in the project area. Utilities at the point of diversion will be removed as part of project actions, as described below.

Fill Disposal

Fill excavated for the project will be disposed of in an unused reservoir pit on NPS property about 0.75 mile north of the project site at a location that is not visible from Hwy 1 (Figure 1). Its use would not involve extensive site upgrading, and would restore an existing man-made feature into a more natural configuration. There are no wetlands or other waters at this site. About 26,000 cy of material will be hauled to this site for permanent storage.

Removal and Relocation of Utilities

To relocate the channel and construct the new bridge, about six utility poles supporting PG&E and AT&T service lines near Pacific Way will be relocated. About three poles through the existing wetland area may be replaced with undergrounded lines beneath Pacific Way. Utility poles closest to the Pacific Way homes are expected to remain in place. Two poles through the Alder Grove upstream of Pacific Way may also be repositioned to accommodate the new channel alignment. Two existing AT&T utility boxes and their fill pad on the west side of Pacific Way will be removed and relocated to accommodate the new bridge. It is expected that both the fill pad totaling about 0.014 acres and the utility boxes will be relocated closer to Highway 1, causing an equivalent amount of wetland gain and wetland fill. Additionally, the Muir Beach Community Services District (MBCSD) water line that runs along the upstream side of Pacific Way and beneath the existing Pacific Way Bridge would be attached to the new bridge. Finally, a decommissioned well pump and associated above-ground power lines across Green Gulch pasture would be removed. The well pump is located along the levee road upstream of the footbridge, and the lines extend from this location to the east corner of the project site.

Interim Flood Reduction Measures

While the construction of the proposed project activities will not be completed until about 2011, the dysfunctional aspects of Redwood Creek remain, contributing to ongoing channel aggradation and

frequent flooding of Pacific Way under low magnitude, high frequency storm events, with the risk of channel avulsion. These conditions will persist and likely grow worse before the larger restoration project is completed. To address this, NPS and/or Marin County propose to perform interim flood reduction activities in one or two years in preparation for winter storms, prior to project completion, if needed.

Proposed interim flood reduction actions include excavating the channel from up to 400 feet upstream of the Pacific Way Bridge to as far as 100 feet downstream of the bridge. Up to about 3 vertical feet of material would be removed from this reach, or about 1,600 cubic yards.

This interim flood reduction measure would be carried out only when the thalweg of the channel has filled in to about four feet below the bridge soffitt, as it currently is. Under less severe conditions, an alternative would be to operate equipment from the bridge and remove sediment from just within Marin County's 40 foot-wide right-of-way both upstream and downstream of the bridge. Another interim action would be to remove log jams upstream in the project area if they appear to be obstructing flood flows or contributing to sediment aggradation at the bridge.

Excavated material would be transported to the unused reservoir pit (described above) for temporary storage, and possibly used in the implementation of other project actions, such as backfilling old channels. All interim flood reduction actions would be conducted during the low flow period, between August 1 and October 31. Cofferdams would be established at the upstream and downstream end of the work areas, to prevent turbidity in downstream areas during the work. Flow downstream of the work areas would be maintained by pumping the creek around the work area. Fish would be removed from the work area prior to establishing the coffer dams by using seines, dip nets and electro-fishing methods, and fish nets would be extended across channel both up and downstream of the work area to prevent them from re-entering during the work. All fish would be removed and relocated to other locations in Redwood Creek per requirements of the National Marine Fisheries Service (NOAA Fisheries). If possible, this action would be conducted during a dry year when the creek bed is dry and no fish are present.

Invasive Species Removal and Revegetation

Proposed actions entail removing invasive non-native plant species. In particular, Cape ivy and non-native invasive perennial grasses, such as kikuyu grass, panic veldt grass, Harding grass, and tall fescue would be removed from various locations at the project site. Nonnative species outside the project boundary that would be likely to spread to the project site would also be targeted for removal, particularly the Harding grass in the alluvial fan south of the project boundary. Himalayan blackberry, the non-native blackberry, and other non-natives would also be targeted for removal.

Cape ivy removal would be prioritized in the approximately 6- to 7-acre alder grove upstream of Pacific Way to preclude its spread into new downstream areas after the channel is realigned. The Green Gulch tributary portion would also be included as part of this first phase. The second priority would be removal in the riparian area adjacent to the parking lot, since this area could be contained temporarily, preventing reestablishment.

Cape ivy removal would consist of cutting, raking and hauling, with 3 years of follow-up to remove sprouts. Generally, about 98% of Cape ivy cover is removed in the first year's activities, but 2 years of persistent follow-up is required to ensure eradication of the remaining 2%. Removal would rely on manual techniques; a formal consultation, under Section 7 of the federal Endangered Species Act (ESA), on Cape ivy removal prohibits herbicide use within 150 feet of coho salmon habitat. The presence of CRLF at the site would likely also preclude herbicide use.

During construction, kikuyu grass would be excavated to rooting depth (approximately 1 foot) at locations where it occurs at the project site, particularly shoreward of the existing parking lot and at the intersection of Green Gulch Trail and the existing levee road, along the levee road, and at more isolated locations around the edges of the site. The removed plants would be composted at a local site or disposed of at an appropriate facility that accepts green waste. This excavation would create additional wetlands in the short-run and, possibly converting to dunes in the long-run with the build-up of wind-blown sand.

NPS will grow native riparian and wetland vegetation at its native plant nursery in the Redwood Creek Watershed for outplanting at the project site. All propagules used in the nursery are collected in the Redwood Creek Watershed. Nursery work and outplanting are primarily conducted by volunteers under the guidance of a nursery manager and restoration coordinator.

Temporary Construction Impacts

Temporary Road for Pacific Way Access

A temporary by-pass road adjacent to Pacific Way must be provided during construction of the new Pacific Way Bridge since the road provides the only access to some Muir Beach homes. The temporary road would be located south of Pacific Way and would remain active until the new bridge is completed. This bypass is expected to rejoin Pacific Way immediately east of the existing Pacific Way Bridge. The bypass road is assumed to be about 200 feet long and wide enough to accommodate two-way traffic, or about 20 feet. The road will be paved if it will be in place over winter months so that it can serve as grade control to protect against channel avulsion while the project is still in construction and the existing creek channel remains in use. The construction of the by-pass road will entail the removal of some riparian vegetation in this 0.1-acre area.

Temporary Haul Roads for Construction in Wetlands

Because project design has not been completed, detailed estimates for the area to be disturbed or temporarily filled for construction actions are not yet available. However, it is assumed that fill will be placed to create temporary haul roads in the wet floodplain areas for heavy equipment constructing the new channel alignment and wetlands, temporary stockpile areas and temporary staging areas. A total area of about 0.7 acres is assumed for these actions. However, wherever possible, low impact methods for access roads, such as temporary placement of mats or plywood as opposed to new road grading, may be used where appropriate, although they would not be used for the Pacific Way bypass road. Staging areas would be located in previously disturbed locations to the extent possible, including the existing parking lot, the emergency turnaround near the pedestrian bridge, and the horse ring near Highway 1. The specific locations of access roads, staging areas, etc., will be identified during project design, and will be selected to minimize the potential for adverse impacts.

Construction Phasing, Schedule and Major Tasks

Detailed construction phasing will be developed as part of project design; the information presented here is intended to identify the major tasks associated with construction, as well as any constraints driving construction phasing.

Construction is anticipated to begin in about 2009 and would take about 3 years to complete, working only during the dry months. This estimate of construction duration would be shortened by extending the seasonal construction window.

Site Preparation and Mobilization

Project mobilization will include set up of unpaved staging and parking areas including clearing and grubbing, recycling of debris, installation of unpaved access and hauling roads, installation of construction interpretation and signage, equipment mobilization, installation of construction fencing and gates, installation of best management practices (BMPs) for erosion control and other aspects of resource protection, and installation of the temporary creek crossing over an ephemeral drainage to the Banducci Field for hauling vegetation for composting.

Creek Realignment

This will include clearing and grubbing while avoiding as many mature trees as possible, excavation of the backwater channels, main channel, tributary channels, drainage swales, and the levee road, filling of portions of abandoned channels (where applicable), large woody debris installation, berm construction, and revegetation. Once the new channels and other water features are complete, this task will involve flow diversion and connection with new channel, as well as fish relocation and monitoring.

Construction Season

Most construction (and particularly in channel work) would be restricted to the August 1–October 31 dry season. Tree removal would be conducted outside of the nesting season (after August 1). Some construction activities, such as those related to the parking lot, may be permitted to occur outside of the seasonal work window. Although the dry-season timing of the construction window will prevent potential construction-related impacts to migrating coho salmon and steelhead, construction will be phased to protect rearing juvenile coho salmon and steelhead that may occur in the stream channels.

At present, flows in Redwood Creek are bifurcated into two channels, with the west channel being the dominant channel. The new channel would be excavated without disturbing the existing eastern channel, leaving it intact to provide habitat for juvenile rearing. A portion of the eastern channel would be excavated to connect and extend the backwater channel. Prior to excavation, the western channel would be physically isolated from the eastern channel and fish would be relocated. Relocation would involve a variety of methods, including herding them away from the site, and the use of nets and/or electrofishing to capture fish. Nets or cofferdams would be used to prevent entry of fish into the project area during construction activities. Handling of these fish would be overseen by a qualified biologist with appropriate handling permits. The existing western channel, proposed for partial filling would not be backfilled until flows were diverted to the new channel/lagoon system.

and fish were safely relocated. Backfilling the abandoned channel would be sequenced to minimize the potential for fish stranding or increases in turbidity.

If construction were phased over several years, creek restoration would be sequenced to provide a through-going creek channel allowing fish up- and downstream passage during the period between construction seasons (November–August), which corresponds roughly with salmonid spawning and migration.

Visitor Parking

Visitor parking at Muir Beach during construction would be maintained to the maximum extent possible. Portions of the parking lot may be used for staging areas, and so would result in reduced parking capacity. In addition, during construction of the new parking lot, as well as during other phases of construction, the parking lot may be closed entirely. The parking lot would be constructed in the off-peak or shoulder season when park visitation is less, if possible.

Dewatering

To reduce suspended sediment, dewatering of the creek channel would be conducted when construction is performed in the active channel. Cofferdams and a pumped bypass would be used to dewater the construction zone, and a bypass pipe would pump flows to the downstream reaches. Because dewatering is anticipated to occur during low-flow conditions, the bypass pipe would be several inches in diameter and would be screened to avoid potential for entrainment. Salmonids in any areas to be affected would be relocated prior to dewatering, following requirements from regulatory agencies, using methods as described above. Dewatering that could affect California red-legged frog habitat would not be conducted during breeding season.

One of the goals of this project is to coordinate with local transportation planning efforts to identify project features that are compatible with transportation improvements and consistent with the ecosystem restoration. At this time, one local transportation planning effort is underway by Marin County to create a shuttle stop on Highway 1 at the intersection of Pacific Way. A shuttle stop would allow the existing Muir Woods shuttle to stop at the beach. The Muir Woods shuttle has operated with high ridership for three summers and recently secured grant funding for its fourth year of operation during summer weekends. Despite high ridership, it is not financially self-sustaining. This project would accommodate the shuttle stop through the new trail proposed from Highway 1 along Pacific Way and which would be ADA accessible. In summer 2007, the Muir Woods shuttle also initiated a link with the Sausalito ferry terminal. If the shuttle were to stop at Pacific Way, it would allow visitors to leave San Francisco and reach the beach without the use of a car.

When planning for this project was initiated in 2002, a joint NPS-Marin County regional transportation planning project was underway, but after extensive public meetings, the project was unable to move forward. The Comprehensive Transportation Management Plan for Southern Marin Parklands (CTMP) included Muir Beach as one of several parkland destinations for which public transportation was considered. The CTMP conducted analyses of transportation use on the Highway 1 corridor and the Muir Beach parking lot as well as conceptual alternatives for public transportation along the Highway 1 corridor in southern Marin. CTMP analysts found that to make a shuttle service efficient and financially sustainable, a shuttle could not travel all the way down Pacific Way to the beach parking lot since the added time would substantially increase the time of the shuttle's round-trip, thereby increasing operational costs, reducing the number of trips that can be made in a day, increasing visitor wait periods, and reducing the likelihood of high use. No such service other than the Muir Woods shuttle is planned for this area at this time, and no other public transportation remains operational in this area since the Stage Coach, operated by the Marin County Transit District, discontinued service there in April 2007 due to low ridership. Nevertheless, NPS is committed to continued coordination with County transit planners through other planning processes. If bus or shuttle service is routed to Muir Beach in the future, the design of the new bridge and parking lot would be adequate to support these services; only minor modifications would be needed to accommodate a bus or shuttle stop at the parking area.

Public Safety

The project will provide access in a way that will improve public safety for Muir Beach residents and visitors because the infrastructure – primarily the bridge, parking lot and levee road - will no longer contribute to elevated flows on the road and at adjacent structures during small to moderate flood events. The rotated parking lot and longer bridge will not constrict flood flows or sediment transport, contributing substantially to improved public safety. Public safety will be further enhanced because the new Pacific Way Bridge will accommodate two-way vehicle passage, reducing safety hazards, and it will have an attached multi-use pedestrian trail to segregate pedestrians from traffic. The new bridge will provide for vehicular passage during substantially greater flood events (up to or very close to a 100 year event), eliminating the virtually annual stranding that some Muir Beach residents experience during routine winter events.

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Protection from Visitor Overuse

The project will provide access consistent with the need to protect natural areas from overuse because the project is designed to accommodate existing capacity, will not increase visitation, and will reduce the impacts of visitors by reducing the impacts of access-related infrastructure.

Impacts of visitor-related infrastructure will be reduced substantially because the hydraulic obstruction created by the existing parking lot will be erased by rotating the parking lot, the levee road bisecting the wetland and riparian areas will be removed, and the existing Pacific Way Bridge will be large enough to span both the creek and the floodplain. Salmonid habitat enhancement from a newly-connected floodplain will be the result of modifications to visitor-related infrastructure. Also, since the levee road will be removed and the parking lot will be moved to the edge of the site, visitor use will be restricted to the perimeter of the site. This modification to visitor-related infrastructure will enhance the connectivity of the wetland, creek and riparian habitats and reduce the disturbances to aquatic life or wildlife from hikers, bikers, equestrians or maintenance operations.

NPS Management Policies specifically emphasize the need to provide uses that are “appropriate to the superlative natural ... resources found in [its] parks” and can be sustained without “unacceptable impacts” on park resources or values (NPS Management Policies 2006 Section 8.2). Consistent with these policies, Muir Beach has been managed to allow limited, site-appropriate visitor access since it was added to the National Park System in the 1970’s. A recent survey of visitor experience showed that visitors at Muir Beach do not report feeling overcrowded (Manning and Budruk, 2003). Since available parking is a key factor limiting visitation at Muir Beach, by not expanding the capacity of the parking lot, the project will not increase visitation. Furthermore, observations suggest that resources at the site are best protected through site-specific management actions rather than a reduction in the number of visitors, and this project proposes such a set of actions since the function of the natural resources and the habitats available for special-status species and other aquatic life will be enhanced without reducing the number of visitors.

Over approximately the past 10 years, NPS has taken the following actions to reduce the impact of visitation without reducing the number of visitors:

- Picnicking on a 0.5-acre area shoreward of the parking lot was removed because the area is a wetland.
- A social trail on a fill pad extending from the parking lot directly across the wetland, through the creek and to the beach was removed and allowed to revegetate. Signs were placed to reroute visitors to a pedestrian bridge.
- A water fountain at the beach was removed because it was shown to be one of the largest consumers of water from a well owned by the Muir Beach Community Services District (MBCSD) about a mile upstream. Water extraction from the MBCSD well can affect water surface elevations in Redwood Creek during the low flow period, when conditions for resident coho and steelhead can become critical.
- Formerly highly-trampled back dunes were fenced to allow natural aggradation and planted with native dune species. A route to the beach was defined along the edge of the dunes to avoid trampling.

- Potential impacts of bonfires at the beach were reduced by placing fire pits, which localize the areas where visitors build fires.
- Post-and-cable fencing was constructed along a small wetland immediately inland of the dunes, and the wetland naturally revegetated with wetland species.
- Post-and-cable fencing was constructed along the shoreward edge of the intermittent tidal lagoon to reduce human use.

In addition to the reduction in impacts due to modifying the visitor-related infrastructure, proposed project actions will further reduce impacts of visitation in the following ways:

- The former picnic area shoreward of the parking lot will be excavated to remove a monoculture of the noxious, non-native kikuyu grass. The area will be excavated to just below the rooting depth of the kikuyu grass – about 1 foot, allowing the area to trend to a wetter, seasonally flooded wetland. NPS will revegetate the area with native wetland species, such as the salt-tolerant rushes. The new boardwalk from the parking lot will extend over the new wetland area, and the boardwalk will be located to avoid obstruction of overbank flows. Visitors will experience a more natural, more native, and more expansive wetland area as part of their walk to the beach.
- The new visitor parking lot will have vegetated swales which will function to protect water quality through filtration.
- Non-native trees once planted on the shoreward side of the parking lot will be removed.
- The EIS/EIR allows for additional fencing at the beach to allow the formation of foredunes in addition to the existing backdunes.
- Potable water will not be provided to avoid impacting surface water flows from the MBCSD diversion at a well adjacent to Redwood Creek about a mile upstream of the site.
- Flushing toilets will not be provided to avoid impacting surface water flows; however, existing toilets at the site will be upgraded by providing facilities such as vault toilets.
- Power lines across the wetland area will be removed, reducing roosting by birds of prey over areas where the California red-legged frog is known to breed.

Furthermore, NPS has chosen not to add new visitor amenities such as rentals or concessions at Muir Beach to avoid increasing visitation levels, types of uses, or visitation impacts. NPS also avoids the use of night lighting in order to protect dark skies, and therefore no such features are proposed at the new parking lot. The entrance to the beach is closed just after dusk to reduce night-time partying at the beach.

Beach Watch provides an example of data supporting the NPS management approach visitation at Muir Beach. Shorebird abundance at Muir Beach and Rodeo Beach is substantially lower than that on six other beaches in GGNRA (3 birds/km at Muir Beach compared to 105 birds/km at Ocean Beach South). The low abundance at the beach is attributed to the habitat quality at Muir Beach, not visitation. The findings reported in Beach Watch state: “Whereas Ocean Beach is a long, wide beach that provides an excellent foraging substrate, Muir Beach has coarser grain sands not as suitable for foraging” (Flanagan, 2006). Potential impacts of dogs at the beach – to birds as well as aquatic

habitats such as the intermittent tidal lagoon and the creek - are being addressed in a park-wide Negotiated Rulemaking process, not this project.

Conclusion

By maintaining the existing parking lot capacity, avoiding actions that would increase visitation, modifying visitor-related infrastructure to decrease or remove its impacts on natural resource function, taking additional management actions to further reduce impacts on wetlands and dunes, and continuing management actions to avoid or reduce impacts on water levels or night skies, this project is consistent provisions related to the prevention of overuse in Sections 30210, 30212.5, and 30214 of the CZMA.

Section 30213. Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred.

No entrance or parking fees are charged at Muir Beach or are proposed to be charged under this project. The beach and adjacent areas for recreational opportunities are fully public. Recreational opportunities such as hiking, picnicking, bird watching, beach combing and other such activities are provided at the site and through its trail links.

ARTICLE 3, RECREATION

Section 30220. Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

Section 30221. Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.

Section 30222. The use of private lands suitable for visitor-serving commercial recreational facilities designed to enhance public opportunities for coastal recreation shall have priority over private residential, general industrial, or general commercial development, but not over agriculture or coastal-dependent industry.

Section 30223. Upland areas necessary to support coastal recreational uses shall be reserved for such uses, where feasible.

Current Conditions

Recreational opportunities in the project area include walking, hiking, birding, picnicking, beachcombing, and horseback riding. Limited ocean swimming is feasible, but no lifeguard is available, and visitors are cautioned to beware of rogue waves, undertow, and sharks. A picnic area at the southern end of the parking lot supported 10 tables until interim flood reduction actions

conducted in 2005 to partially removed the picnic-area fill pad to increase the flow conveyance area for Redwood Creek. At this time, about five tables can be accommodated in an undersized picnic area that is generally too close to the parking lot and restrooms to provide an optimum recreational experience.

Several important trails lead to the Muir Beach area, including the Coastal Trail, the Redwood Creek Trail, the Green Gulch Trail, and the Dias Ridge Trail (see Figure 5-1 in the Final EIS/EIR). In general the multi-use routes serve hikers, equestrians, and mountain bikers, although mountain bike use is restricted or prohibited in some areas. Except for the Green Gulch Trail and the southern portion of the Coastal Trail, the existing trails are difficult or dangerous to access from the project area and connections between the trails are largely absent. The existing trail discontinuities are confusing and potentially dangerous for users who must use the shoulders of existing roadways to get from one trail to another.

Analysis and Comments

The effects of this project on recreation are analyzed in detail in Section 4.3.4.1 of the Final EIS/EIR (Recreation and Visitor Experience, pp. 4-215 to 4-245). A brief summary of key findings to support the consistency determination is included here.

The proposed project is consistent with Sections 30220, 30221, 30222, and 30223 of Article 3 of the Coastal Act because it will retain and enhance recreational opportunities at the coastal site. Opportunities for hiking, picnicking, bird watching, beachcombing and similar activities will continue to be available. Hiking opportunities will be enhanced by the improved regional trail link from the new trail along Pacific Way to the realigned Dias Ridge Trail and the Coastal Trail. The relocated picnic area and restroom facilities will be designed to providing the pre-existing capacity of 10 picnic tables and sufficient room for school groups, hiking clubs and others that often gather in the area. Grills will be provided to encourage visitors to use safe practices for outdoor cooking. The picnic area will be designed so as to avoid creation of a hydraulic obstacle. The new placement of the picnic area adjacent to the reconfigured parking lot is likely to provide an enhanced view of both the coast and the adjacent wetlands and riparian area.

The restoration will provide a recreational opportunity through stewardship activities. This is expected to add a recreational opportunity that does not currently exist at the site and may offset some expected reductions in other recreational opportunities during project construction. Furthermore, active participation in stewardship is expected to increase participants' appreciation and awareness of the site's resources, habitat restoration and natural processes. Many people choose stewardship activities as a recreational activity in scenic park lands. The restoration is also expected to result in a more aesthetically pleasing experience for visitors since the site will appear more natural and more integrated.

Trail re-alignments and new access routes are expected to maintain existing recreational opportunities while improving or maintaining the visitor experience. The new pedestrian trail along Pacific Way would offer a more pleasant, relaxing and safer access to the beach. The new, longer boardwalk to the beach will provide an enhanced experience of the gradient of coastal wetland, riparian and dune

habitats. The new emergency access route will maintain visitors' existing ability to access the Coastal Trail and Coyote Ridge area from Muir Beach, while creating a loop trail around the perimeter of the site. The new Pacific Way Trail will link to the new proposed realignment of Dias Ridge.

New interpretive displays and perhaps also an interpretive blind/overlook for birding would help to increase visitor understanding of the diverse natural resources at Muir Beach/Big Lagoon, and would provide opportunities for outreach and education about the restoration process.

Equestrian access to the site will still be available. Although the project may have a minor adverse effect on equestrian pasturing at the adjacent Green Gulch field by slightly reducing available pasturage area, overall the project is expected to result in long-term beneficial impacts to recreational uses. Because the loss of pasturage for one horse at Green Gulch Field 7 is a relatively small change, it is consistent with relevant policies from Marin County's 1994 Countywide Plan (refer to Section 4.3.4.6 of Final EIS/EIR, pp. 4-332 to 4-336) . (The Countywide Plan, in turn, adopted all of the zoning, protection policies, and programs outlined in the Marin County Local Coastal Program (LCP).)

Existing recreational opportunities are expected to be reduced for three consecutive years during project construction. However, project construction will provide the opportunity for a new recreational opportunity through construction and beyond - active participation in restoration stewardship. Following project completion, all oceanfront federal lands in the project area will continue to be available for recreational use consistent with NPS regulations and policies.

ARTICLE 4, MARINE ENVIRONMENT

Section 30230. Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 30231. The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Comment and Analysis

Proposed actions are consistent with Sections 30230 and 30231 of the Coastal Act because the project will:

- maintain or enhance the biological productivity of the coastal stream, wetland and estuary at the project site,
- enhance habitat for federally listed anadromous salmonids which spawn in freshwater and spend up to three years in the ocean environment,
- reduce or virtually eliminate existing substantial interferences with surface water flow patterns,
- substantially expand the natural vegetation buffers protecting riparian habitats,
- and undo historic alteration of the natural stream alignment and area available for floodplain.

While maximum biological productivity, in and of itself, is not a goal of the restoration project, the project will maintain or enhance biological productivity because the project will restore a functional, self-sustaining ecosystem, including wetlands, riparian habitat, and habitat for sustainable populations of special status species, including salmonids and the California red-legged frog. The proposed actions will allow the most natural function of the site in almost a century. The substantial existing constraints on natural function due to infrastructure and hydraulic obstructions will be largely erased by project actions; and the aquatic system, with its diverse sub-habitats, will be allowed to evolve in response to natural processes. The realigned channel will be repositioned following an alignment which occurred prior to the creek's relocation during the early 20th Century. The relocation will both be more stable and allow natural geomorphic variation, create a natural channel gradient tied into the upstream gradient, improve sediment transport, improve flow conveyance, and increase floodplain connectivity.

The combined effect of the realigned channel, modified parking lot, levee removal, and the new Pacific Way Bridge will be to enhance both the quality and the quantity of winter-spring habitat for juvenile salmonids, one of the most critical needs for the federally listed coho and steelhead in Redwood Creek. During greater than average winter flood events, most of the riparian and wetland habitat in the 38-acre project site will be inundated, providing essential floodplain habitat for juvenile salmonids, and for the first time since the 1920's, the floodplain will be fully connected. With the removal of the levee road, juvenile salmonids will be less likely to get stranded on the floodplain. In addition, with likely grading on the floodplain and new backwaters to be created, it is possible there will be an increase in the areal extent of winter-spring habitat of up to 2.1 acres under annual (Q1) flow events.

During construction, the project will be undertaken in a manner that seeks to avoid significant disruption to marine and wildlife habitats and water circulation. Where impacts are anticipated, mitigation and monitoring actions are planned to ensure that the quantity and quality of wetlands is improved.

Table 4.3.4.6-1 in Section 4.3.4.6 of the Final EIS/EIR (pp. 4-338 to 4-364) details how the project is consistent with land planning documents of local, state and federal agencies. Most of these plans include guidelines to protect sensitive habitat, species, and land uses. In addition to complying with

NPS Management Policies and CEQA, the project has been found to be consistent with the following guiding regulations and policies: Marin County Watershed Management Plan, Marin County LCP Unit 1, Marin County Code, the Muir Beach Community Plan, and the Marin Countywide Plan.

More information about the benefits of the project to federally listed salmonids and the California red-legged frog is provided below.

Salmonids

One of the main objectives of the Big Lagoon project is to improve coho salmon and steelhead winter–spring rearing habitat at the project site. Current conditions and the expected effects of the project on salmonids are described in detail in Sections 3.2.3 (pp. 3-47 to 3-50) and 4.3.2.3 (pp. 4-161 to 4-190) and Chapter 6 (pp. 6-5 to 6-12) of the Final EIS/EIR. A brief summary is provided here.

In Redwood Creek both coho salmon and steelhead are protected under the federal Endangered Species Act. Coho salmon in Redwood Creek are part of the Central California Coast Evolutionarily Significant Unit (ESU). Redwood Creek is included in the critical habitat designated for this coho ESU, which was announced on September 2, 2005 and became effective January 2, 2006 (70 FR 52488). The federal listing status of the coho salmon in Redwood Creek was upgraded from threatened to endangered in June 2005 (70 FR 37160). Steelhead in Redwood Creek are part of the Central California Coast Distinct Population Segment (DPS) and were listed as threatened by the NMFS under the federal Endangered Species Act on August 18, 1997 (62 FR 43937–43954).

A primary factor currently limiting salmonid production in the project area and Redwood Creek in general is a lack of winter-spring juvenile rearing areas. Upstream of Pacific Way, juvenile coho and steelhead are present in Redwood Creek year round. However, the creek lacks features (e.g., secondary channels and backwaters, woody debris, exposed tree roots) that provide refugia from high velocity flows, thereby limiting winter habitat (and survival) for juvenile salmonids. Fish entrapment behind the levee road occurs when overbank flows allow salmonids access to the floodplain, but their passage back to the main channel is limited to two small culverts, one of which routinely fills with sediment and requires periodic maintenance. The intermittent tidal lagoon lacks cover for juveniles, and as juvenile salmonids enter it, chances of survival are reduced since the current state of the lagoon lacks the refugia and rearing cover types that are necessary for juvenile coho survival (Fong 1996).

Since the winter of 1994–95, the NPS has conducted comprehensive annual monitoring of coho throughout the watershed, including documenting adult abundance, spawning distribution (redd surveys), and juvenile abundance and distribution (Reichmuth et al., 2006, Stillwater 2005). The understanding of limiting factors to salmonids in Redwood Creek is based on current monitoring activities by NPS as well as extensive work conducted in Redwood Creek previously by Dr. Jerry Smith, fishery biologist of San Jose State University (Smith, 1995, 1996, 1997, 1998, 2000, 2001).

It is expected that the proposed actions will increase both the areal extent and quality of winter-spring baseflow habitat for salmonids compared to existing conditions. Designs will provide adjacent off-channel refuge, remove floodplain obstructions, and increase floodplain connectivity, fish passage,

and extent of backwater channel habitat compared with existing conditions. The floodplain function will be more natural. During annual winter storms, fish using the floodplain will be more likely to find their way back to the channel than under the existing conditions.

The following proposed actions for restoration, public access and the new bridge will improve winter-spring rearing habitat conditions by increasing extent and quality of baseflow habitat, functional floodplain areas, and channel-floodplain connectivity:

- The existing channel upstream of the Pacific Way Bridge will be preserved as a backwater channel with two connections to the new channel, providing additional rearing habitat during winter baseflow conditions.
- The existing 25-foot Pacific Way bridge will be replaced with an approximately 250-foot bridge that spans the floodplain. This will improve floodplain connectivity and benefit water quality.
- Downstream of the Pacific Way Bridge, where the creek will be restored to its original alignment along the low point of the valley through Green Gulch pasture. The upper 800 feet of proposed channel will have roughly the same flow capacity as the existing channel¹ (approximately 250 to 300 cfs) and will inundate adjacent low lying areas in the Green Gulch pasture and adjacent new riparian habitat during average storm events. The lower 400-foot reach (from Green Gulch Creek to levee road) will have reduced capacity² (by the absence of berms in this reach) to further increase the frequency and connectedness of overbank flooding.
- The levee road and associated water control structures will be removed. This will reduce the frequency and duration of ponding in Green Gulch pasture but will significantly improve channel-floodplain connectivity and allow unrestricted fish passage between the pasture and Redwood Creek.
- About 700 to 1,000 linear feet of abandoned remnants of the existing channel will be connected to the realigned creek (and deepened if needed) to serve as backwater channels. In addition, the existing backwater channel (parallel to levee road) will be extended by about 400 linear feet when the levee is removed, and the tidal lagoon will be expanded to create additional backwaters. This will significantly increase the length of backwater channels compared with existing conditions, and provide additional rearing habitat during winter baseflow conditions. These backwater sloughs are expected to provide habitat that is well shaded by mature riparian vegetation and will increase total backwater areas from about 0.2 to 1.6 total acres.

¹ Channel dimensions will be roughly the same as the upstream reach, but conveyance will be reduced because of decreased channel slope (because of natural gradient and meandering) and increased roughness (because of introduced large woody debris, etc.).

² The new channel will be constructed by excavating to the thalweg depth and building up the banks using low berms. Discontinuing the channel berms in the downstream 400-foot reach of the creek will effectively reduce the channel depth by roughly 1 foot and reduce channel conveyance to approximately 150 to 200 cfs.

- Floodplain adjacent to the new backwater at the levee location would also be excavated to a slightly lower grade to expand available floodplain habitat adjacent to open backwaters.
- Large woody materials will be added into the backwater and main channel habitats to provide cover for aquatic life as well as to provide conditions that would help maintain deep pools.
- Tidal conditions will remain unchanged from existing conditions; extreme tidal conditions are expected to continue to delay channel drainage in the lower reach.
- The need for maintenance dredging and the resulting channel and habitat impacts are expected to be significantly reduced.

The approximate areal extent of winter rearing habitat under existing conditions and proposed actions is compared on Figures 6-1 and 6-2 and Tables 6-1 and 6-2 of the Final EIS/EIR. Under the existing hydraulic model for the project, the projected total areal extent of winter rearing habitat for backwaters and floodplain combined is roughly the same for existing and proposed conditions, but the restoration design has the opportunity to expand the areal extent of annual floodplain by up to an additional 2.1 acres where the existing parking lot and picnic area are removed. New grades for those excavation areas were not shown in the existing hydraulic model and are therefore listed as “potential” new annual inundation areas, but this condition is expected to be achieved in project actions.

Increased access to the floodplain is also expected to increase feeding opportunities thereby improving survival and growth. Main channel habitat would be improved by large woody debris (LWD) that would be placed and would accumulate in the lower watershed, maintaining pool depths and providing additional cover for juveniles.

The quality of the habitat will improve since project actions will reduce the likelihood of fish entrapment by removing the levee road and building a long bridge over the floodplain. The potential for fish entrapment behind low-sloping “berms” along the new channel is expected to be rare due to the multiple re-entry points that will be available to fish through backwaters and discontinuities in the berm in the lower 400 feet of the channel in Green Gulch pasture.

Alterations to the channel are expected to improve conditions for salmon migration through the site. The relocation of the channel to the low point of the valley, changes to the channel gradient, and the construction of low berms along channel edges are expected to help maintain the channel form over time, improving sediment passage through the site and reducing the risk of channel avulsion.

Several mitigation measures have been identified in order to ensure success and minimize adverse effects to salmonids. These are briefly described here; for a more detailed discussion, see Section 4.3.2.3 of the Final EIS/EIR (pp. 4-161 to 4-190) and Tables 4.3.2.3-1 (p. 4-169) and 4.3.2.3-3 (p. 4-190).

During the design phase of the project, further refinements may occur to ensure that the project provides a net increase in the extent of areal habitat (FISH-MM-2 in Final EIS/EIR). Water temperatures will be monitored at the site through year 5 to ensure that they remain within an

acceptable range for fish. If temperatures are outside of the appropriate range, NPS may use temporary, artificial means of shading during summer months while riparian vegetation matures (FISH-MM-1). It is possible that channel aggradation could occur over time, especially in the downstream reaches of the project site. If this were to occur impacts could be addressed with implementation of a rescue program, or in the case of severe channel avulsion, through intervention activities (e.g. maintenance dredging). However, the likelihood and frequency of such events is expected to be reduced relative to current conditions resulting in an overall improvement in fish passage.

Short-term effects to salmonids are expected during project construction, but these will be minimized through several mitigation measures. Ground disturbing activities during construction could lead to increased turbidity in the stream which could lead to decreased fitness for salmonids. These effects are not expected to be lethal and would be minimized/mitigated by moving fish from affected channel segments immediately prior to construction in keeping with GGNRA's standard protocol. Fish would not be allowed to re-enter until turbidity levels returned to normal. In-channel construction would be limited to the dry season. Best management practices (BMPs) would also be employed to reduce the potential for release of sediments to water bodies. Avoidance and monitoring of fish sound and pressure levels will be implemented during pile driving for the new Pacific Way Bridge (FISH-MM-3; see p. 4-190 of the Final EIS/EIR).

California Red-Legged Frogs

Another project objective is to maintain or improve breeding and rearing habitat for the California red-legged frog (federally listed threatened, state listed special species of concern). Current conditions and the expected effects of the project on CRLF are described in detail in Sections 3.2.2 (pp 3-41 to 3-42) and 4.3.2.2 (pp. 4-133 to 4-149) of the Final EIS/EIR, respectively. A brief summary is provided here.

The size of the existing CRLF population at Big Lagoon has been variable, however annual surveys have suggested that successful breeding has occurred (Wood 2006). Although the project is not within Critical Habitat as designated by the USFWS, there are no other known populations of CRLF in the Redwood Creek watershed.

CRLF breeding habitat at the project site is reliant on artificial management and the levee – both of which contribute to larger ecosystem dysfunction. The existing levee road allows water to pond in the Green Gulch pasture. The persistence of ponded water through the spring breeding season is in turn dependent on NPS maintenance of the flashboard weir structure on the culvert under the levee where the southern Green Gulch drainage flows into one fork of Redwood Creek.

Because improved channel dimensions of the relocated creek are expected to lower groundwater elevations to a more natural elevation, the project will create two new emergent wetlands for CRLF. The habitat will be designed to provide the necessary hydroperiod, vegetation and microhabitat for breeding and rearing frogs. Overall, the project is expected to result in increased quality and quantity of CRLF breeding, foraging, and overwintering habitat. The newly created wetland habitats are expected to be more stable and sustainable than existing wetlands.

Several mitigation actions have been identified that may be undertaken to minimize impacts to CRLF. These include mitigation measures WLD-MM-3, WLD-MM-4, WLD-MM-5, and WLD-MM-6 in the Final EIS/EIR. Together the mitigation actions will minimize construction-related disturbance and/or mortality of frogs, allow for augmenting of frog populations through introduction from other sites, and minimize predation risks from fish. These mitigation measures are described in detail in Section 4.3.2.2 of the Final EIS/EIR (pp. 4-158 to 4-159).

Section 30232. Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

Comment and Analysis

Proposed actions are consistent with Section 30232 because management of the project area does not entail activities that develop, generate, transport or require large volumes of hazardous materials, but NPS does use petroleum products and hazardous substances for incidental facility maintenance actions, such as mowing or the use of vehicles for trash removal.

Construction could lead to releases of fuels, oils, and other construction-related hazardous materials, which could reach surface or groundwater. Implementation of best management practices will be required during construction, including a spill prevention and protection plan that would outline measures to reduce the potential for spill and isolate accidental spills should they occur. The plan would also identify and limit areas of contaminant storage and transfer to outside of sensitive aquatic habitats.

Section 30233(a). The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

- (1) New or expanded port, energy and a coastal-dependent industrial facilities, including commercial fishing facilities.*
- (2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.*
- (3) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.*
- (4) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.*
- (5) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.*
- (6) Restoration purposes.*
- (7) Nature study, aquaculture, or similar resource dependent activities.*

Comment and Analysis

The project is consistent with Section 30233(a) of the Coastal Act because it is a restoration project with an overall goal to improve stream function and habitat value, including habitat for the federally and state listed coho salmon, the federally listed steelhead trout, and the federally listed California red-legged frog. All components of the project – the restoration, public access and bridge actions – function together to restore function of the coastal creek and wetland system.

Although the project will result in the filling of about 1.367 acres of wetland, this will be offset by the creation of about 1.43 acres of new wetland. Furthermore, although the project will result in shifts in wetland habitat types from emergent marsh to riparian wetlands, there will ultimately be a resulting improvement in wetland habitat and functioning, with a small gain in wetland acreage. Due the new bridge spanning the floodplain, the removal of the levee road, the reconfiguration of the parking lot, and the relocation of the channel to its natural topographic location, the entire 38.8-acre site will be hydrologically connected for the first time since about the 1920's.

NPS conducted an analysis of alternatives under the terms of Section 404(b)(1) (40 CFR 230) guidelines of the Clean Water Act to demonstrate that proposed actions are the least environmentally damaging practicable alternative. This analysis was submitted to the U.S. Army Corps of Engineers in January 2008 and has received verbal approval of its findings that the proposed restoration, public access and bridge alternatives are the least environmentally damaging practicable alternatives (Matsumoto, personal communication). The Alternatives Analysis is attached.

Additional details on the project to support this finding are summarized below.

Wetlands

NPS mapped wetlands in the project area using both the U.S. Fish and Wildlife Service (USFWS) Cowardin system and the U.S. Army Corps of Engineers Section 404 delineation method. The Cowardin system used by NPS is comparable to the Coastal Act definition of wetlands, as it defines wetlands based on the presence of a single parameter - vegetation, soil, or hydrology (Castellini et al, 2006; Cowardin, 1979). The Cowardin wetland map for the site is shown on Figures 4a, 4b, 4c, and 4d, and the wetland types and acreages of each type are shown in Table 4. (Note that Figures 4a and 4c include 2.2 acres on Green Gulch Farm Field 7 that are not included in the Project Area.)

A comparison with the USACE wetland delineation map, shown on Figure 3.2.1-1 in the Final EIS/EIR (follows p. 3-38), shows little difference in the extent of wetlands under the two methods, with 29.1 acres mapped as 404 jurisdictional wetlands and 30.85 acres mapped as Cowardin wetlands. The difference is explained by a sliver of wetland along the Green Gulch Trail at the southern edge of the site and a tiny pocket of wetland adjacent to the access road on the eastern edge of the site, neither of which are delineated as Section 404 wetlands. Existing wetland habitat in the project area includes open water habitat (including tidal/estuarine, brackish and freshwater components), emergent wetland (including brackish marsh, cattail-dominated wetland and wet pasture) and riparian wetland.

Existing wetland functions and values are diminished at the site in the following ways:

- historic land use practices in the watershed have elevated sediment delivery and resulted in increased aggradation and filling of historic lagoon features and the existing creek alignment;
- the channelization of Redwood Creek and poor positioning of the Pacific Way bridge and parking lot which together prevent natural floodplain and geomorphic function;
- a history of agriculture, grazing, fill placement and other disturbances which has degraded habitat qualities and facilitated invasion by non-native plant species such as harding grass and kikuyu grass;
- The wetlands are fragmented by constructed features, including Pacific Way, the parking lot, and the levee road. Function is diminished due to hydraulic obstructions and by reducing the quality of winter habitat for salmonids.
- and the artificial nature of the emergent wetland adjacent to the levee road, maintained by an artificial weir.

The proposed restoration, public access and bridge actions will improve wetland functions and values. Overall improvements to wetland habitat function will result from a more natural geomorphic evolution of the stream channel, improved floodplain connectivity, reductions in non-native species, increase in richness and abundance of native vegetation, improved fish passage and improved nutrient cycling.

The proposed project will not result in substantial net changes in the areal extent of wetland. All project actions affecting wetlands are shown in Table 3a. Of those, a subset of those actions are expected to result in the creation of 1.43 acres of new wetlands and the permanent filling of 1.367 acres of existing wetlands for a net gain in wetland acreage of 0.063 acres (Table 3b). An additional 0.82 acres of wetlands will be temporarily filled during construction (Table 3c).

Although the project does not result in substantial changes in wetland acreage, it will likely change the mosaic of wetland habitat types with a shift in wetland habitat types from emergent marsh to riparian wetlands, although precise estimates of the amount of habitat shift are difficult. The shift in cover is considered a natural response to a more natural landscape condition. There will ultimately be a resulting improvement in wetland habitat and functioning with a small gain in wetland acreage.

Temporary effects to wetlands

Construction activities will result in the temporary loss of wetland acreage, (due to construction of access roads, dewatering, etc.), these areas would be returned to their original condition once construction is complete. Following construction there would be an initial period of ecosystem establishment when restored portions of the ecosystem would have somewhat reduced function and value. However, the ecosystem is expected to be functionally established after 5-10 years, and the resulting wetlands are expected to result in improved wetland functions and values.

Improved Wetland Function and Benefits of the Proposed Project

Overall, the proposed project results in less open water habitat and more riparian habitat than the other two action alternatives that were analyzed through the Final EIS/EIR. Despite this, the selected alternative was identified as providing the greatest benefits to meet the project goal because it will restore a functional, self-sustaining ecosystem to the maximum extent of any of the alternatives.

The proposed project will create the most unobstructed creek and floodplain in the project area since about the 1920s. Sediment will be transported more effectively because the creek channel will be relocated to its natural topographic low point and will slope at a more natural gradient. Sediment transport will no longer be obstructed by an undersized Pacific Way Bridge or an undersized floodplain next to the lower end of the parking lot.

The project will also have the smallest construction footprint of the analyzed alternatives, with relatively short construction duration, and minimizing of construction-related impacts such as dust, noise, and the need to haul and dispose of fill. One of the benefits of the proposed project is that project goals can be achieved without hauling hundreds or thousands of truckloads of excavated fill long distances down Hwy 1 and through the commercial area of Mill Valley. The project components can be completed with all fill either re-used or stored safely in an old, unused reservoir on NPS lands in the local watershed.

The benefits of removing the channel confinements are expected to also enhance the natural range of fluctuation at the intermittent tidal lagoon on the north end of the beach. Creek flows will be able to scour the lagoon more effectively with the improved force of winter flows from an unobstructed upstream channel. The lagoon areal extent and depth will therefore have more natural variability. With added log structures, reminiscent of natural large woody debris washed downstream to the beach in the period before watershed development, coho and steelhead will have improved cover in the intermittent lagoon. Furthermore, the selected alternative will result in less risk of dry period in the lagoon(s) which could negatively impact salmonids and other aquatic life.

NPS is designing the project to reduce the need for future maintenance of sediment deposition, channel configuration, etc. NPS is committed to managing vegetation well into the future to ensure that native species become established and nonnative species are reduced.

Water Quality

Current water quality conditions at the project site are described in detail in Section 3.1.2 of the Final EIS/EIR (pp. 3-21 to 3-24) and are summarized here. Measured temperature and dissolved oxygen levels at the project site are both within ranges adequate to support aquatic life. Salinity levels are typical of an estuarine system, with elevated salinity levels indicative of tidal influence extending upstream to the pedestrian footbridge. Sampling has indicated that nutrient levels are elevated above background concentration, although still meeting drinking water standards. Nitrogen and phosphorous levels have been measured at levels that can lead to nuisance aquatic growth and eutrophic conditions, although measured dissolved oxygen levels are not indicative of eutrophic conditions.

Restoration actions are expected to have negligible effects on some parameters (salinity in Redwood Creek and groundwater, bacteria), and minor to moderate beneficial effects on other parameters (nutrient concentrations, dissolved oxygen levels, nuisance plant growth, potential for nuisance mosquito breeding). The project will have negligible effects on water supply.

Over the long term, project actions related to changes to the parking lot and the Pacific Way Bridge are expected to improve overall water quality. Non-point source runoff from the parking lot will be reduced through the installation of vegetated swales to capture runoff. The new Pacific Way Bridge will reduce vehicle impacts to water quality by raising the bridge out of the floodplain and effectively eliminating overtopping of the road.

Short-term negative impacts to water quality are anticipated during construction, with the following mitigation measures identified to minimize these impacts:

WQ-MM-1: Obtain coverage under General Construction Permit and Implement BMPs

WQ-MM-2: Implement spill Prevention and Control Plan

WQ-MM-3: Implement Turbidity Monitoring and Response Plan

WQ-MM-4: Implement Water Quality Monitoring and Response Plan

Mitigation measures and BMPs are explained in detail on pp. 4-64 through 4-66 of the Final EIS/EIR.

Section 30233 (b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems.

(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the 19 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California ", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division.

(d) Erosion control and flood control facilities constructed on water courses can impede the movement of sediment and nutrients which would otherwise be carried by storm runoff into coastal waters. To facilitate the continued delivery of these sediments to the littoral zone, whenever feasible, the material removed from these facilities may be placed at appropriate points on the shoreline in accordance with other applicable provisions of this division, where feasible mitigation measures have been provided to minimize adverse environmental effects. Aspects that shall be considered before issuing a coastal development permit for such purposes are the method of placement time of year of placement, and sensitivity of the placement area.

Comment and Analysis

Proposed actions are consistent with Sections 30233(b), 30233 (c) and 30233 (d) because methods have been identified to for dredging and spoils disposal to avoid significant impacts to sensitive habitats, listed species, and water circulation.

The Final EIS/EIR identifies the possibility of conducting interim flood reduction actions at the Pacific Way Bridge in the period before the project is fully implemented. Proposed interim flood reduction actions consist of excavating the channel from a maximum of about 400 feet upstream of the Pacific Way Bridge to about 100 feet downstream of the bridge. Up to about 3 feet of material would be removed from this reach if channel elevations reach a critical condition.

The Final EIS/EIR identifies numerous methods to avoid significant disruption to marine and wildlife habitats and water circulation during construction. Permissible construction windows in aquatic habitat will avoid the breeding periods of the California red-legged frog and employ a wide range of mitigations to avoid impacts to the frog. Work on the new creek alignment would be conducted during the low flow season and prior to the onset of spawning season to avoid disruption of salmonid migration period. Dewatering would be conducted as necessary when work is conducted in the active channel alignment to reduce downstream sediment loads. Cofferdams and a pumped bypass would be used during dewatering to maintain downstream flows. Most construction would work also be conducted outside of bird nesting season (March 15 to August 1). Some construction actions, such as those related to the parking lot, may be permitted to be occur outside of the seasonal work window.

Excess fill material excavated from the site for either interim flood reduction or other construction actions – expected to total about 26,000 cubic yards – will be hauled offsite to a safe longterm storage site on an old, unused reservoir on NPS land about 0.75 from the project site. The pit is in a stable location on the hilltop adjacent to the portion of the Coastal Trail north of the Muir Beach overlook. Any type of soil or weedy material could be placed safely in the reservoir for disposal without concerns of sediment run-off. This location also allows truck transport to move against the predominant flow of traffic and avoids the need for trucks to travel through urban areas.

No excavated materials will be suitable for beach replenishment, nor is it needed at this site.

Section 30236. Channelizations, dams or other substantial alterations of rivers and streams shall incorporate the best mitigation practices feasible and be limited to (1) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the floodplain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.

Comment and Analysis

Proposed actions for restoration, public access and the new Pacific Way Bridge are consistent with Section 30236 because their primary function is the improvement of fish and wildlife habitat. While the creek will be altered due to relocating about 2,500 linear feet of channel, it will be relocated to a

their natural state. However, site access improvements to allow for fill disposal activities (e.g., construction of access roads) could expose and/or damage previously undiscovered buried cultural resources. Any impact on such sites would be significant. Mitigation measure CR-MM-1 would reduce this impact below significance thresholds.

Impact CR-F2: Disturbance to Previously Unidentified Cultural Resources During Site Evolution (Long-Term, Years 5 and 50)

None of the fill disposal activities is anticipated to result in changed site evolution over time that could affect undiscovered cultural resources.

All Fill Disposal Alternatives: Negligible.

Impact CR-F3: Disturbance to the "Fan Site" (Long-term, Year 0)

One of the fill disposal sites, the Coastal Trail, would use a truck route that passes through the Fan Site. Should road widening or other improvements be necessary, impacts to the site could occur.

Coastal Trail Alternative: Moderate Adverse. Implementation of mitigation measures CR-MM-1 and CR-MM4 would ensure impacts are less than significant.

All Other Fill Disposal Alternatives: Negligible. Fill hauling and disposal would not be located in proximity to the Fan Site.

4.3.3.9 Mitigation Measures

Mitigation Measure CR-MM-1: Cultural Resources Education, Archaeological Monitoring, and Discovery Measures.

NPS will conduct the following measures to ensure that there are no impacts to known and/or previously undiscovered cultural resources.

Cultural Resources Education for Workers

NPS will provide training to all members of the construction team. Training will involve information regarding what types of cultural materials are likely present in the project area, how to identify cultural materials, and the procedures for contacting the appropriate parties in the event that cultural materials are

encountered during construction activities. All construction personnel will be required to participate in the training, and NPS will prepare written guidelines for identification of cultural materials and procedures to follow in case of a discovery or potential discovery.

Archaeological Monitoring

NPS will ensure that there is an archaeological monitor and representative of the Federated Indians of the Graton Rancheria (Coast Miwok) within 100 feet of ~~the vicinity of~~ recorded archaeological resources during ground disturbing activities. While the goal of the NPS is to preserve archaeological resources, this mitigation measure would ensure that if additional deposits associated with known sites are discovered, there will be an archaeologist and Native American representative on site to identify and assess the find and impacts immediately and to halt construction.

An archaeologist will monitor all ground disturbances during construction to ensure that discoveries of previously unidentified resources are protected until they can be properly recorded and assessed, and management decisions can be made about their treatment. Avoidance in place or no adverse effect from project actions is the preferred approach to all discoveries that are potentially eligible for listing on the NRHP. Consultation with the State Historic Preservation Office will occur for any discoveries made during construction in accordance with 36 CFR 800.13.

Discovery of Archaeological Resources During Construction

If buried cultural resources such as chipped stone or groundstone, historic debris, building foundations, or human bone are inadvertently discovered during ground-disturbing activities, work should stop in that area and within a 100-foot radius of the find until a qualified archaeologist can assess the significance of the find.

Inadvertent discoveries will be treated in accordance with 36 CFR 800.13 (Protection of Historic Properties: Post-review discoveries). The archaeological resource will be assessed for its eligibility for listing on the NRHP in consultation with the SHPO and the Federated Indians of Graton Rancheria (if it is an indigenous archaeological site) and a determination of the project effects on the property will be made. If the site will be adversely affected, a treatment plan will also be prepared as needed during the assessment of the site's significance. Assessment of inadvertent discoveries may require archaeological excavations or archival research to determine resource significance. Treatment plans will fully evaluate avoidance, project redesign, and data recovery alternatives before outlining actions proposed to resolve adverse effects.

If human skeletal remains are encountered, protocols under either federal or state law may apply depending on the jurisdiction. Regardless, all work shall stop in the vicinity of the discovery, and the find will be secured and protected in place. The Marin County coroner and Park Archaeologist will both be immediately notified. If a determination finds that the remains are Native American, and that no further coroner investigation of the cause of death is required, the coroner will then be required to contact the NAHC (pursuant to Section 7050.5[c] of the

California Health and Safety Code) and the County Coordinator of Indian Affairs. If the remains are on federal land or under federal jurisdiction, they will also be treated in accordance with the Native American Graves Protection and Repatriation Regulations at 43 CFR 10.4 (Inadvertent discoveries).

According to the California Health and Safety Code, six or more human burials at one location constitute a cemetery (Section 8100), and disturbance of Native American cemeteries is a felony (Section 7052).

Mitigation Measure CR-MM-2: Educate the Workers Conducting the Harding Grass Removal and Have an Archaeological Monitor in the Vicinity of the Fan Site.

NPS will provide training for all personnel involved with nonnative species removal to facilitate recognition of potential archaeological materials and to avoid impacts to deposits.

In addition, NPS will implement CR-MM-1 and retain an archaeologist to monitor in the vicinity of the Fan Site during Harding grass removal activities.

Mitigation Measure CR-MM-3: Limit Compaction Methods Above the Recorded Deposit; Consult with NPS, the County, and FIGR; and Clarify Site Disposition During the Design Process.

Compaction of the CA-MRN-674 may occur as a result of public access or bridge action alternatives. NPS will ensure that mechanical subsurface compaction does not occur in the vicinity of recorded deposits associated with CA-MRN-674. Consultation regarding project effects on CA-MRN-674 will be conducted between the National Park Service, the County of Marin, and the Federated Indians of Graton Rancheria as the final design for the bridge and access are in preparation, and may include additional subsurface surveys, possibly conducted as part of geotechnical borings, to clarify the status of CA-MRN-674 under portions of Pacific Way. If this assessment results in a finding of adverse effect, then the National Park Service will consult with the SHPO, in addition to the County of Marin and the Federated Indians of Graton Rancheria, to resolve the adverse effect.

Mitigation Measure CR-MM-4: Fence Off the Fan Site Fill Hauling So That Trucks Cannot Inadvertently Damage the Site

To avoid inadvertent truck damage to the Fan Site, NPS will fence off the archaeological deposit during the period of time when truck traffic would be traveling this route.

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2 April 2008

Reply To: NPS030131A

Brian O'Neill
General Superintendent
National Park Service
Golden Gate National Recreation Area
Fort Mason
San Francisco, CA 94123

Re: Section 106 Consultation for the Big Lagoon Ecosystem Restoration, Muir Beach,
Marin County, CA

Dear Mr. O'Neill:

Thank you for your letter of 25 February 2007, requesting my comment pursuant to the National Historic Preservation Act as amended and the implementing regulations codified at 36 CFR 800 with regards to the above undertaking. You are requesting concurrence with the NPS' determination that the above referenced project will not have an adverse affect on historic properties.

As I understand it, the undertaking consists of the evaluation of alternatives to restore a functional, self-sustaining ecosystem, and provide public access that is compatible with the ecosystem restoration at Big Lagoon, Muir Beach. Under consideration are three restoration alternatives, six public access alternatives, four bridge alternatives, and five fill disposal alternatives for the project.

The NPS had now completed the identification and evaluation portion of the project, and you are asking that I concur with the finding of effects for this undertaking. I am presently able to concur with the finding based on the additional material submitted with your letter.

Thank you for considering historic properties as part of your project planning and I look forward to continuing this consultation. If you have any questions, please contact Amanda Blosser of my staff at (916) 654-9010 or e-mail at ablosser@parks.ca.gov.

Sincerely,

Susan K Shattler for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

MWD:ab

EXHIBIT NO. 11
APPLICATION NO.
CD-14-08