Malibu Creek Ecosystem Restoration Study

Los Angeles and Ventura Counties, California

Appendix P

Coordination Act Report (CAR)

U.S. Army Corps of Engineers
Los Angeles District

November 2020

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DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, U.S. ARMY CORPS OF ENGINEERS
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017

September 14, 2017

Environmental Resources Branch

Mr. Steve Henry
Field Supervisor
U.S. Fish and Wildlife Service
2493 Portola Road, Suite B
Ventura, California 90802-4221

Dear Mr. Henry:

The U.S. Army Corps of Engineers, Los Angeles District (Corps) has been conducting informal consultation with the U.S. Fish and Wildlife Service (USFWS) in accordance with the Endangered Species Act (ESA) for the Malibu Creek Ecosystem Restoration Project. Initial coordination between the Corps and USFWS began in July 2007, and continues through the present. This coordination included collaboration with USFWS during the development of the Draft Coordination Act Report (CAR), which was provided to the USACE in May of 2013. Informal Consultation was initiated with the USFWS and NMFS in 2016 under provisions of the Federal ESA through a series of telephone calls and email exchanges. A Draft Integrated Feasibility Report (IFR) was provided to the USFWS for comment on January 27, 2017, and included draft ESA determinations for review by USFWS pursuant to the ESA.

The Draft IFR contained the discussion on species potential to occur at the site, survey measures to identify presence/absence of potentially occurring species prior to the start of construction, and conservation measures to avoid take should species be found on site. The Draft IFR concluded that, for species not found on site, there would be no effect. We have reevaluated our initial determination and concluded that a single, rather than a conditional dual, determination, is appropriate for the Locally Preferred Plan (Alternative 2b2), which at this time is anticipated to become the Recommended Plan. As this represents a change from the initial determination presented for public and agency review in the Draft IFR, we are formally notifying your office of this change in determination. This change will be reflected in the Final IFR, which will be provided to your agency for review and comment when completed. Where our "no effect" determination is based in part upon the absence of the species, pre-construction surveys for endangered species, where noted below, will be conducted, as appropriate, within suitable areas to confirm absence of such species. The Corps would consult with the USFWS if future surveys conducted during the pre-construction phase indicates that conditions have changed such that the Corps determines that one or more listed species may be affected. The same determinations and approaches would apply to each species under the NER Plan, with the exception of the NER Plan's use of Site F.

If your office has documentation or evidence of presence of any of these species within the project area, please provide that to us. We will review any such information as part of the Final IFR preparation process to ensure we have made the appropriate effect determinations.

Should you require additional information or have any questions, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, email: lawrence.j.smith@usace.army.mil.

Sincerely,

Eduardo T. De Mesa
Chief, Planning Division

Enclosure

Species	Status	Potential for Occurrence	Potential for Effect
Plants			
Braunton's milk vetch (*Astragalus brauntonii*)	FE, 1B	No potential	No effect.
Marcescent dudleya (*Dudleya cymosa ssp. marcescens*)	FT, CR, 1B	Low potential	No effect.
Santa Monica dudleya (*Dudleya cymosa ssp. ovatifolia*)	FT, 1B	Low potential	No effect.
Lyons's pentachaeta (*Pentachaeta lyonii*)	FE, CE, 1B	Low potential in Area F only.	LPP: no effect.* NER Plan: no effect.
Fish			
Tidewater Goby (*Eucyclogobius newberryi*)	FE, CSC	No potential.	No effect.
Birds			
Least Bell's Vireo (*Vireo bellii pusillus*)	FE, CE	Low potential	No effect.
California Least Tern (*Sternula antillarum browni*)	FE, CE	Low potential	No effect.
Western snowy plover (*Charadrius nivosus nivosus*)	FT	No potential	No effect.
Southwestern willow flycatcher (*Empidonax traillii*)	FE, CE	Low potential	No effect.
Yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	FC, CE	No potential	No effect.

* The LPP (Locally Preferred Plan) is the alternative design that is anticipated to be adopted as the Recommended Plan by the Corps, in consultation with CDPR, our local sponsor. However, final resolution is pending. An alternative plan, the National Ecosystem Restoration (NER) Plan, is possible, but considered to be unlikely.

PLANTS

Braunton's milk vetch (*Astragalus brauntonii*): no potential to exist on site, no effect.

Marcescent dudleya (*Dudleya cymosa ssp. marcescens*) and Santa Monica dudleya (*Dudleya cymosa ssp. ovatifolia*) have low potential to occur at the project site or within the access road. The Corps' current determination is no effect. Pre-construction surveys at the appropriate time of year will confirm absence. If pre-construction surveys identify the presence of this species, the Corps would reevaluate its effect determination and initiate informal consultation if the alternative may affect this species; conservation measures such as those presented below would be included as part of an informal consultation initiated.

Anticipated Conservation Measures if species later determined to be present:
If any of the special-status plant species are determined to be present on site, then individual plants would be enumerated, photographed, and flagged. Timing of field surveys would correspond with blooming or growth seasons when species are conspicuous and recognizable. Seed collection from individuals with mature seed that are likely to be impacted would be conducted for post-construction propagation.

Lyons's pentachaeta (*Pentachaeta lyonii*): Beach placement of sands would require temporary stockpiling at Site F, an upland area, prior to transportation to the beach for placement under the NER Plan. Impacts at Site F include burial of flora and fauna similar to the project site. Lyon's pentachaeta (*Pentachaeta lyoni*) may occur at Site F. The LPP (Locally Preferred Plan) is the alternative design that has been proposed as the Tentatively Selected Plan by the Corps, in consultation with CDPR, our local sponsor. The LPP does not include beach placement and Site F would not be impacted. Therefore, a survey would not be needed and the project would have no affect on this species. Surveys would be performed prior to construction should the Corps ultimately select the NER Plan, which includes use of Area F as a temporary stockpile area, and if determined that the species is present and may be affected by the plan, the Corps would initiate informal consultation.

FISH

Tidewater Goby (*Eucyclogobius newberryi*): Construction practices for controlling construction debris will ensure that no debris enters Malibu Creek in sufficient quantity to affect water quality at the lagoon. Therefore, dam removal would have no effect on this species.

BIRDS

Least Bell's Vireo (*Vireo bellii pusillus*): This species is found within riparian habitats. They have anecdotally been observed in the watershed near Pacific Coast Highway, but no confirmation of presence has occurred. Suitable habitat for the species has not been identified in the project area. The USACE shall conduct USFWS 2001 protocol pre-construction surveys (three pre-construction surveys 10-14 days apart for presences/absences of territorial males) for least Bell's vireo in all areas supporting suitable habitat that may be affected by the project. Absence of this species shall be confirmed through surveys prior to construction activities. The Corps would consult with the USFWS if future surveys conducted during the design or construction phases indicate that conditions have changed such that the Corps determines that the species may be affected. A monitoring and avoidance/minimization plan would then be developed.

California Least Tern (*Sternula antillarum browni*): The beach and nearshore receiver sites identified at the time of the Draft IFR are located more than thirteen miles north of the California least tern nesting site located on Venice Beach. During summer 2017 (Jamie King, California State Parks, personal communication) successful nesting occurred within ½ mile to the west at the mouth of the Malibu Lagoon. This migratory species may be present during nearshore placement activities for the LPP. The area in the nearshore placement site is not likely to be used

for foraging by California least tern due to distance from the nearest nest site, and closer available foraging areas within the lagoon and immediately offshore of the river mouth. This migratory species will not be present during beach placement activities for the NER Plan. The USACE, therefore, has determined that the placement of sand on the beach at the Malibu Pier Beach or into the designated nearshore placement area will not affect California least tern.

Western snowy plover (*Charadrius nivosus nivosus*): There were reports of nesting plovers on Surfrider Beach in 2013 (Chris Dellith, personal communication) and fledging in 2017 (Jamie King, personal communication) not in the location currently being considered for beach placement. The beach fronting Malibu Lagoon is critical habitat for snowy plover, but would not be adversely modified by the proposed placement downcoast adjacent to Malibu Pier. Movement of sand onto the beach placement site as part of the NER Plan would be away from beach areas occupied by snowy plovers and is sufficiently far that delivery and placement activities would have no effect on any snowy plovers. Additionally, the beach placement site is too narrow with no suitable beach for snowy plovers to roost. Placement in the nearshore associated with the LPP would have no effect on this shore species as they would not be encountered at the near shore site. The USACE, therefore, has determined that the project will have no affect on the western snowy plover.

Southwestern willow flycatcher (*Empidonax traillii*): Suitable habitat is present and there have been reported sightings as a migrant in Malibu Canyon. However, this species is considered to have low potential to occur at the project site. Absence of this species shall be confirmed through surveys prior to construction activities in relevant areas (Malibu Creek). The Corps would consult with the USFWS if future surveys conducted during the design or construction phases indicate that conditions have changed such that the Corps determines that the species may be affected. A monitoring and avoidance/minimization plan would then be developed.

Yellow-billed cuckoo (*Coccyzus americanus occidentalis*): This species is considered to be absent from the project site. The USACE, therefore, has determined that the project will have no affect on the yellow-billed cuckoo

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
08EVEN00-2018-CPA-0027

January 18, 2018

Eduardo DeMesa, Chief
Planning Division, Los Angeles District
U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, California 90053-2325

Subject: Final Fish and Wildlife Coordination Act Report for the Malibu Canyon Ecosystem Restoration Project, Los Angeles County, California

Dear Mr. DeMesa:

Please find enclosed the final Fish and Wildlife Coordination Act Report (final CAR) by the U.S. Fish and Wildlife Service for the Malibu Canyon Ecosystem Restoration Project. This work product is provided under Military Interdepartmental Purchase Request number W81EYN51336881 and the Scope of Work dated July 2007.

On May 17, 2013, we submitted to your office a draft copy of the subject report (draft CAR) for review. On November 13, 2017, we received your response with comments and edits on the draft report. Your response described the tentatively selected plan (Alternative 2b2) which is different from the preferred alternative we analyzed in the draft CAR. We acknowledged the change in the project description in the final CAR; however, the changes were not substantial enough to change our conclusions regarding species at issue, and the changes to the project description do not change our recommendations regarding restoration and conservation.

Your response identified a number of species we had listed in the draft CAR which the Corps says are not likely occur to occur within the study area or at the barriers proposed for removal. In the enclosed final CAR, we have elaborated on which species are within the study area and which species are likely to be at the barriers proposed for removal. We have documentation that supports our claims that these species are indeed within the study area and will provide it under separate cover. Other species we identify as potentially occurring with the study area that do not have supporting documentation are identified because suitable habitat is present and the study area is within the range of the species. We have recommended surveys and/or monitoring to determine if the species are actually there. We also recommended contingency plans for relocation in the event they are detected. We conclude that a lack of documented surveys for the species in the study area does not indicate they are not present or would not be detected during focused surveys.

Your response also indicates that Corps disagrees with some of our recommendations; especially, recommendations for restoration such as non-native species removal. We offer that restoration consists of removing non-native plant and animal species and should not be limited solely to the proposed barrier removal sites, as the intent of the project is restoring the Malibu Canyon ecosystem. We further suggest that re-introducing native species to Malibu Canyon is also part of restoration and not beyond the scope of the project.

Lastly, subsequent to our issuance of the draft CAR, we have learned that California red-legged frogs (*Rana draytonii*) have dispersed into the upper reach of Las Virgenes Creek within the study area. Information from the Mountains Restoration Trust (MRT) indicates that California red-legged frogs are now present as far south as 0.45 mile downstream of the Highway 101 Bridge. In particular, MRT has observed five California red-legged frogs within the study area between the Agoura Road Bridge and the northern terminus of Lost Hills Road. The species was thought to be extirpated from Las Virgenes Creek outside of the Upper Las Virgenes Creek Open space until July 2017, when MRT observed California red-legged frogs near the study area just north of the Highway 101 Bridge. MRT first observed California red-legged frogs in the study area in October 2017. We reasonably expect this population of California red-legged frogs to grow and disperse further into the study area (i.e., downstream) as restoration activities progress. We attribute this population expansion to crayfish removal by the MRT and the City of Calabasas' non-native vegetation removal projects in this reach of Las Virgenes Creek. Regarding the City of Calabasas's project, your North Coast Section, regulatory branch, initiated formal consultation on its proposed authorization of the City's activities on December 19, 2017. On January 8, 2018, we issued a biological opinion on the effects of the City of Calabasas' restoration project concluding that the project, as proposed, is not likely to jeopardize the continued existence of the California red-legged frog.

We appreciate your support during development of this Coordination Act Report and we look forward to working with you further on this project. If you have any questions, please call me at (805) 677-3333 or Chris Dellith of my staff at (805) 677-3308, or at chris_dellith@fws.gov.

Sincerely,

Stephen P. Henry
Field Supervisor

Enclosures

FINAL FISH AND WILDLIFE COORDINATION ACT REPORT

Malibu Canyon Ecosystem Restoration Feasibility Study
Los Angeles County, California
2018-CPA-0027

Prepared for the

U.S. Army Corps of Engineers
Los Angeles District

by the

U.S. Fish and Wildlife Service
Ventura Fish and Wildlife Office
Ventura, California

Stephen P. Henry, Field Supervisor
Chris Dellith, Senior Fish and Wildlife Biologist

January 2018

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INTRODUCTION

This document constitutes the Fish and Wildlife Coordination Act Report (Report) in fulfillment of the scope of work number W81EYN51336881 dated July 5, 2007, between the U.S. Fish and Wildlife Service (Service) and the U.S. Army Corps of Engineers (Corps) regarding the ecosystem restoration feasibility study of the Malibu Canyon in Los Angeles County, California. This report has been prepared in accordance with provisions of the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C.661 *et seq*.) and other authorities. The purpose of the FWCA is to provide for equal consideration of fish and wildlife conservation with other features of federally funded or permitted water resource development projects. The Corps directed the Service in the Fiscal Year 2007 Scope of Work and during a phone conversation between Chris Dellith, Service biologist, and Larry Smith, Corps biologist on May 1, 2013, to consider the study area to be Malibu Creek beginning at the Century Dam downstream to the influence of the Malibu Lagoon, and including Las Virgenes Creek beginning at State Highway 101 downstream to its confluence with Malibu Creek, and Cold Creek beginning at Stunt Road downstream to its confluence Malibu Creek. This area encompasses approximately 1,722 acres (see Figure 1).

Our analysis of this project and the recommendations provided herein are based on information provided in: 1) the supplemental scope of work for the Malibu Creek Environmental Restoration Feasibility Study (Corps 2008); 2) various scientific papers, technical reports, memoranda, and letters (see literature cited); 3) information contained in the Service's files and library; 4) interviews with other biological experts and study area landowners; and 5) the Service's best collective professional judgment.

This report provides: 1) a description of the public fish and wildlife resources within the proposed project area; 2) a list of observed and potentially present Federal or State-listed, candidate, proposed, and sensitive flora and fauna within the proposed project area; 3) an analysis of Alternative 2b: Full Dam Removal with Mechanical Transport and Upstream Barrier Removal and its effects on biological resources of the study area; and 4) our recommendations regarding Alternative 2b.

Rindge Dam, built in 1926, is the largest disruption to stream flow and aquatic and riparian habitat connectivity on Malibu Creek between Century Dam and the Pacific Ocean. The Rindge Dam was built as a private water supply dam for the Rindge family ranch and other business concerns. The reservoir originally provided approximately 574 acre-feet of water storage for agricultural needs. No reservoir currently exists behind Rindge Dam, and the sediment impounded behind the dam has filled to the crest of the dam's spillway, nearly 100 feet above the elevation of the original streambed. Approximately 780,000 cubic yards of sediment, approximately a third of which could be used beneficially to restore area beaches, are impounded behind the dam.

In 2005, Heal the Bay (Abramson and Grimmer 2005) conducted a fish barrier survey in the Malibu Creek watershed, identifying potential impediments to steelhead

(*Oncorhynchus mykiss*) migration. In total, there were 35 listed barriers within the Malibu Creek watershed that impede or block fish passage at moderate to high flows upstream of Rindge Dam, 29 of which are manmade and 6 are natural (i.e. waterfalls and cascades). Out of the 29 manmade barriers upstream, 8 have been identified under Alternative 2b2 for removal based on the cost to remove the barrier, access to upstream habitat, and the location of natural barriers. This report analyzes the removal of the eight upstream barriers along Cold Creek and Las Virgenes Creek tributaries, in addition to the removal of the Rindge Dam. Two of the manmade barriers, identified as CC4 and CC7 in the draft version of this report submitted to the Corps in May of 2013, and included in the initial Feasibility Study, have been removed and are no longer included in the plans.

The Corps conducted a feasibility study to investigate reasonable alternatives to restore Malibu Creek by removing the Rindge Dam and upstream barriers. To do so, the Corps created a Project Delivery Team (PDT) consisting of key Corps, DPR, and grantor staff. The PDT created a Technical Advisory Committee (TAC) who convened a variety of subcommittees to work on different aspects of the dam removal and habitat restoration. These subcommittees include: a Biological Resources/Habitat Evaluation Subcommittee, Natural Transport Subcommittee, Sediment Management Subcommittee, and Public Outreach Subcommittee. These groups are comprised of Federal, State, and local agencies, as well as non-governmental organizations. The two groups discussed in this report are the PDT and TAC. The TAC works closely with all of the other feasibility study and subcommittees to coordinate the formulation and evaluation of alternative plans. The TAC works closely with the Public Outreach Subcommittee to collaborate and avoid duplication of efforts and coordinates all environmental fieldwork associated with the feasibility study and resource agency coordination.

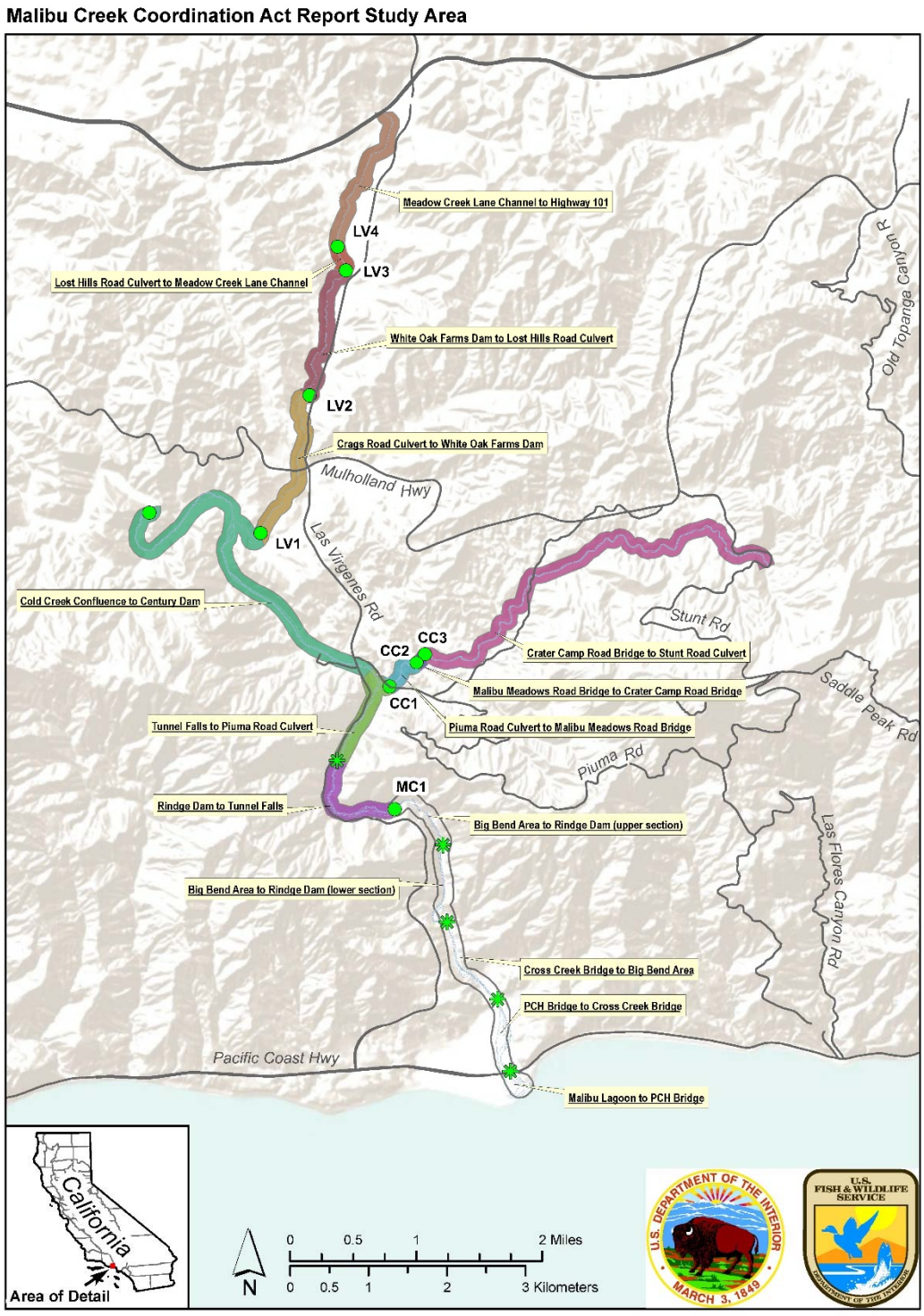

Figure 1. Malibu Canyon Restoration Study Area

DESCRIPTION OF THE STUDY AREA

The climate of coastal southern California is characterized by warm, dry summers and cool, relatively wet winters. Typical winter temperatures range from 40 to 60 degrees Fahrenheit, while 65 to 95 degrees Fahrenheit can be expected during the summer months. Precipitation consists almost entirely of winter rainfall, averaging about 15 inches per year in the area.

The study area is located in the Malibu Creek watershed, which is located approximately 30 miles west of downtown Los Angeles in Los Angeles County, California. The Malibu Creek watershed drainage area covers approximately 110 square miles of the Santa Monica Mountains and Simi Hills. The watershed includes: Malibu Creek, Las Virgenes Creek, Cold Creek, as well as many other smaller drainages and tributaries. Elevations in the watershed range from over 3,100 feet at Sandstone Peak in Ventura County to sea level at the Santa Monica Bay. Malibu Creek runs through Malibu Canyon, which contains steep to very steep sloping hills with a narrow floodplain and riparian zone, in a generally southern route. Malibu Creek itself is approximately 10 miles in length and runs from Malibu Lake to Malibu Lagoon. Rindge Dam is located on Malibu Creek approximately 2.5 miles upstream of the Pacific Ocean. Although the watershed is modified by residential development, reservoirs, and agricultural operations, a large majority of the land is held as part of the Santa Monica Mountains National Recreation Area, or is part of unincorporated Los Angeles County. Malibu Creek from Malibu Dam to the lagoon is also part of the Malibu Creek State Park operated by the California Department of Parks and Recreation. The canyon areas consist of coastal sage scrub and chaparral vegetation communities. Malibu Creek, Las Virgenes Creek, and Cold Creek support riparian vegetation dominated by cottonwoods, willows, and other shrubby and herbaceous species. Rindge Dam is surrounded by steep slopes with a chaparral plant community. The dam is an impediment to the natural flow of Malibu Creek and is a complete barrier to southern steelhead attempting to reach headwater spawning grounds, including habitat within Malibu Canyon above Rindge Dam.

The eight barriers proposed for removal located upstream of the Rindge Dam are listed in Table 1.

Table 1. Upstream Reaches with Barriers

Reach	Downstream – Upstream Barrier ID	Creek or Tributary	Reach Length (feet)
Cold Creek Confluence to Century Dam	Cold Creek Confluence (no barrier) – Century Dam	Malibu Creek	18,630
Crags Road Culvert Crossing to White Oak Farms Dam	LV1 – LV2	Las Virgenes	6,712
White Oak Farms Dam to Lost Hills Road Culvert	LV2 – LV3	Las Virgenes	6,353
Lost Hills Road Culvert to Meadow Creek Lane Channel	LV3 – LV4	Las Virgenes	1,017
Meadow Creek Lane Channel to Agoura Road Concrete Channel	LV4 – Agoura Road	Cold Creek	7,592
Piuma Pipe Arch Culvert to Malibu Meadows Road Bridge	CC1 – CC2	Cold Creek	1,824
Malibu Meadows Road Bridge to Crater Camp Road Bridge	CC2 – CC3	Cold Creek	562
Crater Camp Road Bridge to Cold Canyon Road	CC3 – CC5	Cold Creek	6,543
Cold Canyon Road Culvert to Stunt Road Culvert	CC5 – Stunt Road	Cold Creek	12,011

Note: CC6 is a natural barrier (large waterfall) located within the CC5 – CC8 reach
CC4 is an artificial barrier removed in 2016
CC7 is an artificial barrier removed in 2013

Malibu Lagoon encompasses approximately 36 acres and extends about 0.25 mile inland from the Pacific Ocean. Malibu Lagoon was the subject of a restoration project that was completed in January 2013 and involved the following features: 1) change to the lagoon configuration; 2) modification of the lagoon slopes and drainages, 3) removal of non-native plant species, and 4) replanting with native vegetation.

At least 45 special-status species may occur in the types of habitat found in the study area. This includes 12 listed species (Federal or State) and 63 species of concern.

The habitat types described below are classified using Cowardin et al. (1979) for wetlands and broad physiognomic units for uplands. Cowardin et al. (1979) recognizes five major wetland types (i.e., marine, estuarine, lacustrine, riverine, and palustrine) that differ with respect to hydrology, geomorphology, and biogeochemical factors. Within each of these five major types, wetlands can be classified further according to hydrologic

regime, substrate type, water chemistry, and vegetation. Habitat types present in the study area include all five of the major Cowardin et al. (1979) wetland systems, and a single major upland vegetation type (mixed scrub and chaparral). The approximate aerial extent of the various habitat types within the project area are shown in Table 2.

Table 2. Acreages and Percentage of Total Area of Different Habitat Types Found in the Defined Study Area of the Rindge Dam Removal Project (Corps 2013)

Habitat	Study Area (acres)	% of Total
Lacustrine System	0.3	0.0002
Riverine System	46.2	2.7
Palustrine System	118.1	6.8
Estuarine System	24.1	1.4
Mixed Scrub and Chaparral	1,533	89
Total	1,721.7	100

DESCRIPTION OF PREFERRED ALTERNATIVE

Seven alternatives were originally explored by the Corps for this project, including a no-action plan (Corps and CDPR 2008). The Malibu Creek Environmental Restoration Feasibility Study screened restoration alternatives that were considered in the plan formulation process. Screening criteria included the preliminary identification of adverse impacts related to air quality, water quality, noise, habitat, and biological resources. The engineering feasibility and costs, where available, were also considered.

The project description has been modified since the Draft Coordination Act Report (CAR) was prepared. The Corps, in consultation with the California Department of Parks and Recreation (CDPR), has tentatively selected Alternative 2b2 from the Draft Integrated Feasibility Report as the preferred alternative. This alternative is the Locally Preferred Plan (LPP). The Corps identified a similar alternative, Alternative 2d1, as the National Ecosystem Restoration (NER) Plan. Both alternatives include removal of the dam and eight upstream barriers. The number of barriers to be removed has decreased from nine to eight, as addressed in the Draft CAR. One of the upstream barriers included in the Draft CAR (CC4) was removed in 2016. This Final CAR focuses on the LPP, which is described as follows:

Alternative 2b2 - Full Dam Removal with Mechanical Transport and Upstream Barrier Removal

The Tentatively Selected Plan (Alternative 2b2) includes incremental removal of Rindge Dam's concrete arch and spillway over an estimated 8-year construction window, working during the dry seasons. The 780,000 cubic yards of impounded sediment behind the dam would be mechanically removed using excavators, bulldozers, and other similar

equipment, and hauled away using 20 cubic yards trucks to offsite locations each construction season. The dam arch would be removed in lifts concurrently with the removal of impounded sediment. Dam concrete blocks would be transported to the Calabasas Landfill using 20 cubic yards trucks. The upper portion of the spillway would be removed while access is still available from the top during initial stages of impounded sediment removal. The lower portion of the spillway would be removed in the latter years of construction when access can safely be established for crews and equipment from what remains of the dam arch and impounded sediment.

Restrictions in the construction schedule due to environmental windows (e.g., streamflow), weather, daily hauling restrictions, and other factors, require the removal of sediment and dam and spillway structure to be phased over 8 years. Vegetation will be removed outside of the nesting season for migratory birds (February 1 through August 15) to the extent possible to avoid impacts to nesting migratory bird species. Weather restrictions prohibit construction activities during the winter rainy season of October to April when it is not safe to work in Malibu Canyon. Daily hauling is assumed to be limited to 6 hours for non-school days and Saturdays to comply with Los Angeles County highway restrictions, operating from 9:00 am to 3:00 pm. No hauling would occur at night or on Sundays. On school days, trucking is limited to 5 hours per day, from 9:00 am to 2:00 pm.

Pre-construction/Site Preparation - Year 1
Extensive site preparation would be required to accommodate the sediment and dam and spillway removal operations. To allow for sufficient time, site preparation activities would be scheduled to commence in fall of the first year and continue the following spring through fall (Year 1). Site preparation activities would be suspended during December and January. A schedule with a list of site preparation activities is described in Table 3.

Table 3. Year 1 Schedule and Activities

Schedule	Activities
Sep 15 - Nov 30	• Installation of environmental protection measures, as needed • Minimal rebuilding of existing access ramp (import approx. 15,000 cy of material to patch ramp) • Clear vegetation as much as possible, haul material to landfill
Feb 1 – Oct 15	• Installation of environmental protection measures, as needed • Fully rebuild existing access ramp utilizing sediment excavated from impoundment site • Construct new access ramp utilizing sediment excavated from impoundment site • Establish staging area at Sheriff's Overlook

	• Clear vegetation; haul to disposal site • Construct temporary coffer dam • Install dewatering wells and dewatering system
Oct 15 – Nov 30	• Prepare site for winter/rainy season

During the initial site preparation work, minimal rebuilding of the existing access ramp would be accomplished to allow equipment access into the sediment impoundment area to begin vegetation clearing. This would include the import of approximately 15,000 cubic yards of material to patch the existing ramp. A staging area would be established at an area known as Sheriff's Overlook, located above the canyon along Malibu Canyon Road. All necessary environmental protection measures would be implemented. At the end of this initial site preparation work window, preparations at the work site would be made in anticipation of the rainy season and equipment would be removed from the impoundment site.

The following year, after the rainy season, site preparation activities would continue within the canyon (February through November), as weather permits. The existing access ramp as well as a new ramp would be fully built with sediment excavated from the impoundment area. A total of approximately 107,000 cubic yards of impounded material would be used to build the ramps. Rock or riprap may be used to protect the ramp side slopes from erosion during the winter season. Vegetation clearing activities would continue within the sediment impoundment area with the material hauled out of the canyon to a landfill.
A dewatering system would be installed and tested. This would include a coffer dam approximately 60-feet across by 10-foot high constructed at the upstream end of the sediment excavation area to collect inflowing water from upstream. Dewatering pumps and piping would be installed (approximately 11 pumps) throughout the impoundment area. Pumped water would be piped to the coffer dam impoundment to allow for solids to settle. Water from behind the coffer dam would then be routed by pipeline to the dam and spillway area where a hose or tubing would be used to route the water from the top of the dam and spillway area to an area downstream. As part of the site preparation activities, the dewatering system would be fully tested and adjusted as needed to effectively dewater the work area in preparation of the main sediment excavation activities.

At the end of Year 1, the dam and sediment impoundment site would be prepared for the winter season, which would include removal of all heavy construction equipment and the dewatering system from the impoundment area.

Year 2
Commencement of sediment excavation and removal and lowering of the dam face would begin the next construction season (Year 2), February through November, as weather permits. All necessary environmental protection measures would be in place. The dewatering and water diversion system would be reconnected and the coffer dam would be rebuilt. The access roads would be repaired and vegetation would be cleared as necessary within the sediment excavation footprint. Dewatering activities would begin in

March and are estimated to take about one month. Sediment excavation and disposal operations would begin in April and end around October 15. Once equipment and truck access is provided to the top of the dam structure (estimated to be about 1 month (May 1) after commencement of sediment excavation work), removal of the concrete dam structure would begin (Table 4).

Table 4. Years 2 through 8 Schedule and Activities

Schedule	Activities
Feb 1 – Feb 29	• Installation of environmental protection measures, as needed • Clear vegetation as needed, material hauled to landfill • Repair access ramps as needed • Reconnect dewatering system including rebuilding of coffer dam
Mar 1 – Mar 31	• Begin dewatering of impounded sediment area
Apr 1	• Begin sediment excavation and disposal activities
May 1	• Begin concrete dam demolition
Oct 15	• Complete sediment excavation and disposal activities; begin preparation for winter/rainy season
Oct 31	• Complete concrete dam demolition to match excavated level of sediment impoundment, if extra time needed
Nov 30	• Complete preparations for winter/rainy season

Sediment would be excavated from downstream to upstream, which would allow equipment to access the dam and spillway face to facilitate the cutting and removal of the concrete structures while sediment excavation moves further upstream. Approximately 168,100 cubic yards of coarse material, gravel, and larger material would be excavated and removed from the impounded sediment area between April and October 15. The material would be taken to the Calabasas Landfill, approximately 8 miles from the dam site to be available for reuse or disposal. The Corps estimates that an additional 125,600 cubic yards of sand would be removed and transported to the beach for nourishment. During this year, approximately 32,400 cubic yards of sand would be placed at Surfrider Beach, near the mouth of Malibu Creek, and 93,200 cubic yards of sand would be placed at Topanga Canyon Beach, approximately 6 miles down coast from Surfrider Beach. Beach placement would begin in July at Topanga Canyon Beach, and then shift to Surfrider Beach after Labor Day weekend. Once the target volume is reached at Surfrider Beach, beach placement would shift back to Topanga Canyon Beach and end around October 15.

Deconstruction of the dam structure would begin around May 1, concurrent to sediment excavation operations, once equipment access is established at the dam face. The concrete dam face would be removed from the top down as the dam face is exposed by the sediment excavation operations. The Corps estimates that the dam would be lowered about 38 feet in height in Year 2 to match the new lowered elevation of the impounded

sediment area. The concrete dam face would be cut into 6 foot by 6 foot by 7 foot (about 19 ton) blocks with cutters (diamond wire) and saws. The cut block would then be placed into a truck to be taken to the Calabasas Landfill or another site for recycling or disposal. The Corps assumes that 20-cubic yard trucks would be utilized for the transport of the concrete blocks; therefore two blocks could be transported with one 20-cubic yard truck. The concrete cutting would progress concurrent to the sediment excavation activities, and continue, if needed, into late October.

At the end of Year 2, around October 15, the dam and impounded sediment site would be prepared for the winter season, which would include removal of all heavy construction equipment and the dewatering system from the impoundment area.

Year 3

Sediment excavation and dam removal operations in Year 3 would be similar to Year 2. The overall schedule would be the same. Site preparations such as environmental protection measures, repair of ramps, vegetation clearing, reconnecting of the dewatering system, and rebuilding of the coffer dam would begin in February, as weather permits. Dewatering would begin around March 1, sediment excavation operations would begin around April 1, and dam deconstruction would begin around May 1.

In Year 3, approximately 131,400 cubic yards of sand would be excavated from the dam site and transported to the nearshore placement site. Dam deconstruction operations and schedule would be similar to Year 2 (Table 4). The Corps estimates that the dam would be lowered about 15 feet in height in Year 3 to match the new lowered elevation of the impounded sediment area.

Sediment excavation and disposal operations are expected to end around October 15, with winter season preparations, similar to Year 2, beginning thereafter. If needed, the dam concrete cutting work would continue into late October.

Year 4

The overall schedule for site preparations, dewatering, sediment excavation, and dam deconstruction in Year 4 would be the same as Years 2 and 3. Sand excavation at the impounded sediment area and beach nourishment at the nearshore placement site would resume in April. The Corps estimates that 19,000 cubic yards of sand would be excavated from behind the dam and placed at Zuma Beach. Once the target volume of sand at Zuma Beach is reached and the sand layer is removed from the impounded sediment area, excavation of the silt and clay layer would begin. The Corps estimates that 147,700 cubic yards of the silt and clay material would be excavated and transported to the Calabasas Landfill during the remainder of this construction year.

Dam deconstruction operations and schedule would be similar to Years 2 and 3 (Table 4). The Corps estimates that the dam would be lowered about 20 feet in height in Year 4 to match the new lowered elevation of the impounded sediment area.

Sediment excavation and disposal operations are expected to end around October 15, with winter season preparations, similar to Years 2 and 3, beginning thereafter. As with Years 2 and 3, the dam concrete cutting work would continue into late October, if needed.

Years 5 through 8

The overall schedule for site preparations, dewatering, sediment excavation, and dam deconstruction in Year 5 would be the same as the previous years. The Corps anticipates that all remaining sediment and dam face would be removed by the end of this construction year. Approximately 187,900 cubic yards of material would be removed and transported to the Calabasas Landfill for disposal this construction year. This would include about 82,300 cubic yards of the remaining silts and clay from the sediment impoundment area, about 60,500 cubic yards of material that was used to rebuild the existing access ramp (south bound), and about 45,100 cubic yards of material used to construct the new ramp (north bound).

Dam deconstruction operations and schedule would be similar to Years 2, 3, and 4 (Table 4). The Corps estimates that the dam could be lowered about 35 feet in height sometime between Years 5 and 8, which would be the last remaining concrete face or structure of the dam.

Sediment excavation and placement operations are expected to end around October 15. Revegetation of the newly exposed area would be completed thereafter.

Access Ramps

Two ramps would be constructed to accommodate equipment and truck access into and out of the construction area. There is an existing ramp or road (south bound) located approximately 0.75 mile upstream of Rindge Dam. The entrance and exit of this existing ramp is south-bound facing and could only accommodate truck traffic in a south-bound direction exiting the site and north-bound traffic entering the site. To accommodate initial equipment access, the existing ramp would be patched with about 15,000 cubic yards of imported material. During the full site preparation work window (Year 1, February to November), the existing ramp would be expanded to accommodate access for larger equipment and south bound traffic required to transport beach quality sand to beaches. A new ramp would also be constructed to accommodate larger equipment access and north bound traffic to Calabasas Landfill. A total of approximately 107,000 cubic yards of impounded material would be used to build the access ramps. At the end of construction (Year 5), the new ramp and the expanded portion of the existing ramp would be removed and restored.

Within the sediment impoundment area, vehicles and large equipment would utilize designated haul roads within the work footprint.

Spillway

The spillway removal operation would consist of pre-splitting the concrete from the rock substratum, drilling and micro-blasting the surface to fracture the concrete, and manually

breaking the concrete. The spillway concrete would be loaded onto trucks for transport offsite. The spillway would be removed to match the elevation of the new lowered elevation of the impounded sediment each construction year.

Disposal Sites
The Calabasas Landfill has been identified as the only feasible site available to receive the larger sized material (gravel, cobble, boulders) and fines (silts and clays). The Corps assumes that material transported to Calabasas Landfill would remain at the landfill and be available for reuse by interested parties.

All beach quality material (sand) would be transported and placed at a nearshore placement site near Malibu Pier. Geotechnical investigations performed by the Corps in 2002 identified an approximate 340,000 cubic yards layer of sand-rich material, underlain by silt-clay and overlaid by gravel. The sand layer consists of 73 percent sand, 22 percent fines, and 5 percent gravel. Based on coordination with the Southern California Dredged Material Management Team (SC-DMMT), which includes participation of the U.S. Environmental Protection Agency, California Coastal Commission, Regional Water Quality Control Board, and other resource agencies, the quality of the sand would be acceptable for direct placement on beaches or into a nearshore placement site (SC-DMMT Meeting, February 2013). However, to ensure that the material is of beach quality, the SC-DMMT recommended that sediment quality be confirmed prior to nearshore placement and quality assurance measures are in place during construction. To address these concerns, additional sediment testing is proposed prior to excavating the sand-rich layer to confirm that the material is acceptable for direct placement on beaches. Sampling for grain-size gradation of receiving beaches would also be performed. Quality assurance measures would be developed during the design phase to ensure that only beach quality material is transported and placed on beaches.

To reduce the number of truck trips and overall construction schedule, 20-cubic yard trucks would be utilized to transport excavated material from the impounded sediment area to the offsite disposal locations (Calabasas Landfill and beaches).

The eight upstream barriers are briefly described below.

LV1 – Crags Road Culvert
The existing concrete box culvert, the existing concrete abutments, and the existing concrete wing walls would be removed and replaced with a pre-manufactured 75-foot long, 20-foot wide clear span bridge. This new bridge would span the entire creek and eliminate the current reduction in the creek cross section. The new bridge's deck elevation would match the top elevation of the existing structure. The pre-manufactured bridge would reduce construction time because the bridge would be delivered to the site and placed on the new abutments with a crane. Prior to installing the new bridge the new wing walls and the new bridge abutments would be constructed on both banks of the creek. The creek bed would be contoured to fill any voids left by the removal of the existing structures. The bridge construction is anticipated to take approximately 15 days. The creek flow would be diverted during removal of the existing structures and

construction of the new abutments and wing walls. Water diversion would also be necessary while any work is being performed within the creek, and during construction of the new bridge wing walls and the new bridge abutments. The creek would not need to be diverted while the pre-manufactured bridge is being placed on the abutments. .

Vegetation clearing would be necessary for the removal of the existing bridge wing walls and abutments along with construction of the new bridge wing walls and abutments. Additional vegetation clearing would be required at the designated staging area for the project. All areas that are cleared would be restored once construction has been completed.

LV2 – White Oak Dam
The existing 6-foot dam would be removed in stages over 3 years to minimize any erosion and scour problems. The creek would be diverted each year to protect any work crews and equipment used to remove the dam; however, work in the creek would be kept at a minimum because the dam would be removed by a backhoe stationed on the creek bank. Dewatering of the work site would not be required. Demolition is estimated to require 15 days each year. Vegetation clearing would be limited to a 40-foot by 40-foot area on either side of the cofferdam, which would provide the backhoe adequate space to work. These areas would be cleared every year of dam removal work. All areas that are cleared will be restored once the dam removal is completed.

LV3 and LV4 – Lost Hills Road Culvert and Meadow Creek Lane Crossing
The work on LV3 and LV4 would be treated as a single project because fish have to pass through both barriers to reach the habitat areas upstream of LV4. These structures would not be removed, but instead a low flow channel would be constructed along the invert of each structure and along the portion of the stream between LV3 and LV4. The low flow channel for LV3 would be built on top of the existing concrete invert. This new channel would be 6 inches deep and start at the downstream end of the concrete apron and extend upstream, through the culvert structure and terminate at the end of the upstream concrete apron. The new channel would be 3 feet wide and would ensure there is enough water flowing at low enough velocities for fish to pass through the structure. The drop structure at the downstream end of the concrete invert would not be modified. The low flow channel for LV4 would be similar to the channel passing through LV3 and allow fish to travel upstream to the designated habitat areas. Construction is estimated to take 50 days.

The invert of the creek between LV3 and LV4 would be cleared of vegetation and contoured to provide a low flow channel that would connect the concrete channels along LV3 and LV4. This area would be restored once construction is complete. The creek flow would be diverted during construction of both of the concrete low flow channels and while the creek invert between LV3 and LV4 is being contoured. Limited dewatering would be necessary along the creek between LV3 and LV4 to ensure adequate working conditions for construction equipment. Additional vegetation clearing would be required at the designated staging area for the project and along any invert access ramps. The staging area would be restored once construction is completed.

CC1 – Piuma Culvert

The existing corrugated metal pipe (CMP) arch culvert, the concrete lining along the creek invert, and the stone head walls would be replaced with a 12-foot pre-cast arch culvert with new concrete footings and concrete head walls on both sides of the creek. The width and height of the new culvert would match the existing CMP culvert and the road elevations across the culvert would be the same as the existing roadway. The existing metal arch culvert, stone wing walls and concrete invert would be removed in two stages. The first stage would be from the upstream inlet to the centerline of the road, the second state would be from the centerline of the road to the downstream outlet. The culvert must be removed in two parts so the traffic along the road can diverted into one lane across the bridge. The pre-cast culvert would reduce construction time because the culvert would be delivered to the site and placed on the footings with a crane. Prior to installing the new culvert sections, new headwalls and the new footings would be constructed. Construction is estimated to require 30 days. The concrete invert of the creek would be replaced with a natural channel. The creek bed under the culvert would be re-graded to compensate for the small elevation drop at the end of the existing concrete invert. Temporary shoring would be required to preserve the road while the existing metal culvert and stone wing walls are removed. The temporary shoring would be placed perpendicular to the centerline of the creek and run parallel to the existing CMP culvert for 46 feet. The temporary shoring would be required on the north and south sides of the existing structure and would be removed once the new bridge abutments and wing walls are completed.

The creek flow would be diverted during removal of all the existing structures and construction of the new footings and headwalls. The creek would also be diverted while any work is being performed within the creek bed. Dewatering would be necessary during construction of the new culvert footings and headwalls. Vegetation clearing would be required for the removal of the existing culvert wing walls and abutments along with construction of the new culvert footings and headwalls. Additional vegetation clearing would be required at the designated staging area for the project. All areas that are cleared of vegetation would be restored once construction is complete.

CC2 – Malibu Meadows Road Crossing

The existing wood deck, steel beam bridge along with the concrete invert and CMU (concrete masonry units) abutments and wing walls would be removed and replaced with a 70-foot long, and 25-foot wide pre-manufactured bridge with concrete abutments and wing walls on both sides of the creek. The new bridge would have a longer span than the existing structure to help eliminate the reduction of the creek cross section and the bridge deck elevation would match the existing bridge deck elevation. The pre-manufactured bridge would reduce construction time because the bridge would be delivered to the site and placed on the new abutments with a crane. Prior to installing the new bridge, new wing walls and the new bridge abutments would be constructed on both banks of the creek. Construction is estimated to take 30 days. The existing concrete invert would be removed and replaced with a modified stream bed. The stream bed improvements would be designed to compensate for the 5-foot drop at the end of the existing concrete invert while allowing fish passage upstream. The stream bed improvements would prevent head

cutting upstream of the new bridge. The creek flow would be diverted during removal of all the existing structures and construction of the new abutments and wing walls. The creek flows would be diverted while any work is being performed within the creek bed. The creek would not be diverted while the pre-manufactured bridge is being installed. Dewatering would be necessary during construction of the new bridge wing walls and the new bridge abutments. Vegetation clearing would be necessary for the removal of the existing bridge wing walls and abutments along with construction of the new bridge abutments and wing walls. Additional vegetation clearing would be required at the designated staging area for the project. All areas that are cleared of vegetation would be restored once construction is complete.

CC3 – Crater Camp Road Crossing
The bridge at CC3 is similar to the one at CC2 and would be replaced in a similar manner.

CC5 – Cold Canyon Road Culvert
The existing 25-foot diameter concrete culvert cannot be removed so a low flow channel would be constructed along the culvert's invert to allow fish passage upstream. The low flow channel would be 6 inches deep and 3 feet wide. The downstream portion of the culvert would not be modified because fish can use existing ponds to make their way into the low flow channel. The creek invert near the inlet of the culvert would be cleared and contoured to ensure flows can enter the low flow channel. Creek flows would be diverted during construction but no dewatering would be necessary. The Corps estimates construction will require 15 days.

DESCRIPTION OF BIOLOGICAL RESOURCES IN THE PROJECT AREA

Plants

A total of 695 species of vascular plants from 108 families have been documented to date from the Santa Monica Mountains (McAuley 1996, National Park Service (NPS) 2008, CNDDB 2013). Most of the observed plants are common to the region and many in the study area are widely distributed. State or federally listed, candidate, or otherwise sensitive plant species encountered during surveys or previously documented are described below. Potentially, some of the historically documented rare species in the Malibu Canyon watershed could occur within the study area and are therefore included in the descriptions below. Taxonomy nomenclature is from Baldwin et al. (2012).

The California Native Plant Society (CNPS) has developed an inventory of rare and endangered vascular plants of California that contains several lists, as follows: 1) List 1A: Plants presumed extinct in California; 2) List 1B: Plants rare, threatened, or endangered in California and elsewhere; 3) List 2: Plants rare, threatened, or endangered in California, but more common elsewhere; 4) List 3: Plants about which more information is needed - a review list; and 5) List 4: Plants of limited distribution – a watch list (CNPS 2001).

Lyon's pentachaeta (*Pentachaeta lyonii*)
Lyon's pentachaeta is federally listed as endangered. This species is also listed as endangered by the State of California and is a CNPS List 1B species. This plant is found in open areas amongst chaparral, coastal sage scrub, and valley and foothill grasslands. This species is known from fewer than 30 extant occurrences in the Santa Monica Mountains and Simi Foothills (Service 2008). Lyon's pentachaeta is threatened by development, fire regimes, non-native vegetation, and recreational activities. This species may occur within Site F, part of the NER, Alternative 2d1. Upland Site F is not part of the Tentatively Selected Plan, Alternative 2b2.

Braunton's milkvetch (*Astragalus brauntonii*)
Braunton's milkvetch is federally listed as endangered and is a CNPS List 1B species. This plant is found in closed-cone coniferous forest, chaparral, coastal scrub, valley and foothill grassland, and recently burned or disturbed areas, usually carbonate. This species is known from fewer than 20 extant occurrences in the Santa Ana Mountains, San Gabriel Mountains, Santa Monica Mountains and Simi Foothills (Service 2009a). Braunton's milkvetch is threatened by development, fire regimes, non-native vegetation, and recreational activities. This species has not been documented in the study area; however, it was reported at Malibu Lagoon in the 1970s and again in 1984. These plants detected at the lagoon are presumed to be from seeds or plants washed down during rains from the higher elevations in Malibu Canyon (CNDDB 2013). Although suitable habitat for this species occurs within the study area, it does not occur at the barrier removal sites including Rindge Dam.

Coulter's goldfields (*Lasthenia glabrata ssp. coulteri*)
Coulter's goldfields is a CNPS List 1B species. This plant is found in marshes, estuaries, lagoons, playas, and vernal pools. This subspecies is known from Kern, Los Angeles, Orange, Riverside, Santa Barbara, San Bernardino, San Diego, San Luis Obispo, and Ventura counties. It is also found on Santa Rosa Island and Baja California. Coulter's goldfields are threatened by urbanization and agricultural development. This subspecies has been documented in the vicinity of Malibu Lagoon, but the exact location is unknown; therefore, it could be in Reach 1 of the study area (CNDDB 2013).

Santa Monica dudleya (*Dudleya cymosa* ssp. *ovatifolia*)
Santa Monica dudleya is federally listed as threatened and is a CNPS List 1B species. On a broad scale, suitable habitat for this subspecies is generally located on sedimentary and conglomerate rock on canyon bottoms and shaded slopes in drainages along the south-facing slope of the Santa Monica Mountains. Adjacent plant communities include coastal scrub and chaparral (Service 2009b). This subspecies is known from fewer than four extant occurrences in Los Angeles, and Orange counties. Santa Monica dudleya are threatened by development and recreation. This species is known to in the Santa Monica Mountain National Recreational Area upstream of the site, but is considered to have low potential to occur at the barrier removal sites including Rindge Dam.

Malibu baccharis (*Baccharis malibuensis*)

Malibu baccharis is a CNPS List 1B species. This plant is found in chaparral, cismontane woodland, and coastal scrub. This species is known from four occurrences in the Santa Monica Mountains, Los Angeles County. Malibu baccharis are threatened by urbanization. This species has been observed upstream of Rindge Dam, near the Malibu Creek State Park headquarters, but is expected to have a low potential to occur at the barrier removal sites including Rindge Dam.

Marcescent dudleya (*Dudleya cymosa* ssp. *marcescens*)
Marcescent dudleya is a federally listed as threatened is a CNPS List 1B species. This plant is found in chaparral on volcanic soils and is endemic to the Santa Monica Mountains (Service 2009c). The subspecies is known from eight occurrences. Marcescent dudleya is threatened by development and foot traffic. This species is known to occur in the Santa Monica Mountain National Recreational Area, but is considered to have low potential to occur at the barrier removal sites including Rindge Dam.

Davidson's saltscale (*Atriplex serenana* var. *davidsonii*)
Davidson's saltscale is a CNPS List 1B species. This plant is found in coastal bluff scrub and coastal scrub habitats. The species is known from Baja California to Ventura County, including Santa Catalina, Santa Cruz and Santa Rosa islands and is believed to be extirpated from Los Angeles County. This plant has also been reported in Riverside County. This subspecies has been documented in the vicinity of Malibu Lagoon, but the exact location is unknown; therefore, it could be in Reach 1 of the study area (CNDDB 2013).

Invertebrates

Approximately 60 families representing 34 orders of invertebrates are documented to occur within the Los Angeles Basin, which includes the Santa Monica Mountains (Hogue 1993). Some of the orders of insects recorded during benthic macro invertebrate surveys conducted by Heal The Bay in 2010 include various damselflies and dragon flies (Odonata), mayflies (Ephemeroptera), water striders (Hemiptera), beetles (Coleoptera), syrphid flies (Diptera), stoneflies (Pleocoptera), and caddis flies (Trichoptera). Although data was not recorded for butterflies and moths (Lepidoptera), representatives of this order expected to occur within the study area include the following families: skippers (Hesperiidae), swallowtails (Papilionidae), cabbage butterflies (Pieridae), gossamer-winged butterflies (Lycaenidae), and brush-footed butterflies (Nymphalidae).

Other representatives of at least the following insect orders could also be reasonably expected to occur: Orthoptera (grasshoppers and allies), Dermaptera (earwigs), and Neuroptera (dobsonflies, lacewings, and allies). Insects are a part of the diverse riparian food web - as prey, predators, pollinators, water purifiers, grazers, soil reducers, and mosquito-control agents. The introduced red swamp crayfish (*Procambarus clarki*) were also noted during surveys throughout the aquatic habitat in the study area. Research on invertebrates other than benthic macroinvertebrates within the study area is limited and therefore not addressed in this report; however, the Santa Monica Mountains National Recreation Area BioBlitz conducted on May 30 and 31, 2008, detected approximately 578 species of invertebrates.

The highly invasive New Zealand Mud Snail (*Potamopyrgus antipodarum*) was detected in several locations of the upper Malibu Creek Watershed in 2005 (Dagit and Abramson 2007).

Fish

Thirteen fish species, both native and non-native, have been documented in previous surveys within the study area (Swift et al. 1993, Dagit and Abramson 2007, Moyle 2002). Native freshwater species occurring in the study area include: southern steelhead, arroyo chub (*Gila orcutti*), Pacific lamprey (*Lampetra tridentata*), prickly sculpin (*Cottus asper*), and California killifish (*Fundulus parvipinnis*). Non-native freshwater species occurring in the study area include: green sunfish (*Lepomis cyanellus*), bluegill (*Lepomis macrochirus*), fathead minnow (*Pimephalas promelas*), mosquitofish (*Gambusia affinis*), largemouth bass (*Micropterus salmoides*), common carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), and black bullhead (*Ameiurus melas*). The Malibu Lagoon serves as an important primary and nursery habitat for several fish species. Native estuarine species include: tidewater goby (*Eucyclogobius newberryi*), topsmelt (*Atherinops affinis*), staghorn sculpin (*Leptocottus armatus*), and striped mullet (*Mugil cephalus*).

Southern California steelhead (*Oncorhynchus mykiss*)

The southern California steelhead was originally federally listed as an endangered evolutionary significant unit (ESU) on August 18, 1997, and re-listed as an endangered distinct population segment (DPS) on January 5, 2006, for naturally spawned populations of steelhead and their progeny residing below long-term impassible barriers. Critical habitat was designated for the southern California steelhead on September 2, 2005. Steelhead, an ocean-going form of rainbow trout, is native to Pacific Coast streams from Alaska south to northwestern Mexico. Wild steelhead populations in California have decreased significantly from their historical levels. Extensive habitat loss due to water development, land use practices, and urbanization are largely responsible for the current population status.

Malibu Creek has been identified as a “high value” recovery planning area in the Recovery Plan for California Steelhead (NMFS 2012). A critical recovery task identified in the recovery plan would be to remove Rindge and Malibu dams, and physically modify road crossings, to allow steelhead natural routes of migration to upstream spawning and rearing habitats, and passage of smolts and kelts downstream to the estuary and ocean (NMFS 2012).

Prior to the completion of Rindge Dam in 1926, 14-pound steelhead were reportedly caught as they migrated upstream to the lower reaches of Las Virgenes Creek and Cold Creek to spawn. Observations of small numbers of adult steelhead in Malibu Creek below Rindge Dam have continued to the present, including documented steelhead sightings in 1947, 1952, 1968, 1979, 1986, 1987, 1992, and 2006 through 2011. Recent surveys have documented steelhead rearing habitat, as well as use of this habitat by juvenile fish,

below Rindge Dam. A population of less than 101 adults is the most recent estimate of the Malibu Creek steelhead population (Dagit and Krug 2011).

Pacific lamprey (*Lampetra tridentata*)
Lampreys are specialized aquatic vertebrates, eel-like in form but lacking the jaws and paired fins of true fishes. Pacific lampreys share many habitat requirements with steelhead (*Oncorhynchus* spp; Close et al. 2002, Stone 2006), particularly cold clear water (Moyle 2002) for spawning and incubation. They also require a wide range of habitats throughout their lifetime. Pacific lampreys occur along the Pacific coast from Hokkaido Island, Japan, through Alaska, and south to Rio Santo Domingo in Baja California (Moyle 2002). Anadromous forms of Pacific lamprey occur below impassible dams throughout their range. However, the occurrence of all forms becomes irregular south of Malibu Creek, Los Angeles County, although they have been recorded in the Santa Ana River (Swift et al. 1993) and a single ammocoete was collected from the San Luis Rey River, San Diego County, in 1997 (C. Swift, pers. comm. 1999).

In Malibu Creek, Pacific lampreys are limited to the lower 2.5miles below the Rindge Dam. Substantial collection efforts in Malibu Creek often failed to take Pacific lampreys, and presence records are limited to a few random events, namely sightings of dead adults and collections of ammocoetes. Observations of small numbers of Pacific lamprey in Malibu Creek below Rindge Dam have continued to the present, including documented lamprey sightings in 1981, 1982, 1987, 1991, and 1993 (Swift and Howard 2009).

Several subsequent sampling efforts for Pacific lampreys in Malibu Creek have resulted in negative results, including electro-shocking efforts in August of 2005 (Goodman et al. 2008) in Malibu Creek and near the lagoon interface. Based on multiple sampling efforts in Malibu Creek and the fact that those efforts before 1981 failed to detect Pacific lampreys, this species appears to be rare, difficult to detect, and/or only sporadically present in the system.

Threats to Pacific lampreys include (1) dams and diversions, (2) stream alteration, (3) invasions of non-native species, (4) loss of prey populations, (5) pollution, and (6) fisheries. The nature and degree of all these threats are highly speculative, given the general lack of information on factors affecting lamprey populations.

Tidewater goby (*Eucyclogobius newberryi*)
Tidewater gobies were federally listed as endangered on March 7, 1994. The Service designated revised critical habitat for tidewater gobies February 6, 2013. The tidewater goby, a member of the Gobiidae family, is the only species in the genus *Eucyclogobius*. It is a small fish, rarely exceeding 2 inches standard length, and is characterized by large pectoral fins and a ventral sucker-like disk formed by the complete fusion of the pelvic fins. Tidewater goby are known to occur in the Malibu Lagoon and the lagoon is considered a source population.

The tidewater goby historically occurred in at least 134 California coastal lagoons. This species is currently presumed to occur in about 112 locations throughout its range. Its

decline can be attributed to upstream water diversions, pollution, siltation, climate change, and urban development on surrounding lands. These threats continue to affect the remaining populations of tidewater gobies. In addition, given the lack of a marine life history stage and the high level of fragmentation between existing populations, the probability for exchange between the populations and natural colonization of suitable habitat is low.

Arroyo chub (*Gila orcutti*)
The arroyo chub is a California species of special concern. This species was native to the Los Angeles, San Gabriel, San Luis Rey, Santa Ana, and Santa Margarita Rivers and Malibu and San Juan Creeks. It has been successfully introduced far outside its native range, often with trout plants, into the Santa Clara, Ventura, Santa Ynez, Santa Maria, Cuyama and Mojave River drainages and Malibu, Arroyo Grande and Chorro Creeks. Introduced populations of this species are abundant in the above noted rivers. The species is now absent from much of its native range and is abundant only in the west fork of the San Gabriel River. The arroyo chub appears to prefer low gradient streams, concentrating in pools and backwaters. This species is known to occur in Malibu Creek (NPS 2008, CNDDB 2013).

Amphibians and Reptiles

Amphibians and reptiles were inventoried by intensively searching literature sources, museum records, and consultation with local experts was also used to compile an inventory and discuss potential and historical species occurrences.

Nine species of amphibian and 24 species of reptile are known or reasonably expected to occur in the study area based on a literature and comparisons of known range, distribution, and apparently suitable habitat (Table 5). Because of the secretive nature and nocturnal and fossorial habits of many species, some species can go undetected during survey work. The following summaries describe sensitive amphibians and reptiles known or expected to occur within the study area.

California Red-legged Frog (*Rana draytonii*)
The California red-legged frog was federally listed as threatened on May 23, 1996. The California red-legged frog uses a variety of habitat types, including various aquatic systems, riparian, and upland habitats. They have been found at elevations ranging from sea level to approximately 5,000 feet. California red-legged frogs use the environment in a variety of ways, and in many cases, they may complete their entire life cycle in a particular area without using other components (i.e., a pond is suitable for each life stage and use of upland habitat or a riparian corridor is not necessary). Populations appear to persist where a mosaic of habitat elements exist, embedded within a matrix of dispersal habitat. Adults are often associated with dense, shrubby riparian or emergent vegetation and areas with deep (greater than 1.6 feet) still or slow-moving water; the largest summer densities of California red-legged frogs are associated with deep-water pools with dense stands of overhanging willows (*Salix* spp.) and an intermixed fringe of cattails (*Typha*

latifolia) (Hayes and Jennings 1988). Hayes and Tennant (1985) found juveniles to seek prey diurnally and nocturnally, whereas adults were largely nocturnal.

California red-legged frogs breed in aquatic habitats; larvae, juveniles, and adult frogs have been collected from streams, creeks, ponds, marshes, deep pools and backwaters within streams and creeks, dune ponds, lagoons, and estuaries. They frequently breed in artificial impoundments such as stock ponds, given the proper management of hydro-period, pond structure, vegetative cover, and control of exotic predators. While California red-legged frogs successfully breed in streams and riparian systems, high spring flows and cold temperatures in streams often make these sites risky egg and tadpole environments. An important factor influencing the suitability of aquatic breeding sites is the general lack of introduced aquatic predators. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting population numbers and distribution.

During periods of wet weather, starting with the first rains of fall, some individual California red-legged frogs may make long-distance overland excursions through upland habitats to reach breeding sites. In Santa Cruz County, Bulger et al. (2003) found marked California red-legged frogs moving up to 1.7 miles through upland habitats, via point-to-point, straight-line migrations without apparent regard to topography, rather than following riparian corridors. Most of these overland movements occurred at night and took up to 2 months. Similarly, in San Luis Obispo County, Rathbun and Schneider (2001) documented the movement of a male California red-legged frog between two ponds that were 1.78 miles apart in less than 32 days; however, most California red-legged frogs in the Bulger et al. (2003) study were non-migrating frogs and always remained within 426 feet of their aquatic site of residence (half of the frogs always stayed within 82 feet of water). Rathbun et al. (1993) radio-tracked three California red-legged frogs near the coast in San Luis Obispo County at various times between July and January; these frogs also stayed rather close to water and never strayed more than 85 feet into upland vegetation. Scott (2002) radio-tracked nine California red-legged frogs in East Las Virgenes Creek in Ventura County from January to June 2001, which remained relatively sedentary as well; the longest within-channel movement was 280 feet and the farthest movement away from the stream was 30 feet.

After breeding, California red-legged frogs often disperse from their breeding habitat to forage and seek suitable dry-season habitat. Cover within dry-season aquatic habitat could include boulders, downed trees, and logs; agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay-ricks, and industrial debris. California red-legged frogs use small mammal burrows and moist leaf litter (Rathbun et al. 1993, Jennings and Hayes 1994); incised stream channels with portions narrower and deeper than 18 inches may also provide habitat. This type of dispersal and habitat use, however, is not observed in all California red-legged frogs and is most likely dependent on the year-to-year variations in climate and habitat suitability and varying requisites per life stage.

Although the presence of California red-legged frogs is correlated with still water deeper than approximately 1.6 feet, riparian shrubbery, and emergent vegetation (Jennings and Hayes 1994), California red-legged frogs appear to be absent from numerous locations in the species' historical range where these elements are well represented. The cause of local extirpations does not appear to be restricted solely to loss of aquatic habitat. The most likely causes of local extirpation are thought to be changes in faunal composition of aquatic ecosystems (i.e., the introduction of non-native predators and competitors) and landscape-scale disturbances that disrupt California red-legged frog population processes, such as dispersal and colonization. The introduction of contaminants or changes in water temperature may also play a role in local extirpations. These changes may also promote the spread of predators, competitors, parasites, and diseases.

The historical range of the California red-legged frog extended coastally from southern Mendocino County and inland from the vicinity of Redding, California, southward to northwestern Baja California, Mexico (Storer 1925, Jennings and Hayes 1985, Shaffer et al. 2004). The California red-legged frog has sustained a 70 percent reduction in its geographic range because of several factors acting singly or in combination (Davidson et al. 2001).

Over-harvesting, habitat loss, non-native species introduction, and urban encroachment are the primary factors that have negatively affected the California red-legged frog throughout its range (Jennings and Hayes 1985, Hayes and Jennings 1988). Habitat loss and degradation, combined with over-exploitation and introduction of exotic predators, were important factors in the decline of the California red-legged frog in the early to mid-1900s. Continuing threats to the California red-legged frog include direct habitat loss due to stream alteration and loss of aquatic habitat, indirect effects of expanding urbanization, competition or predation from non-native species including the bullfrog (*Lithobates catesbiena*), catfish (*Ictalurus* spp.), bass (*Micropterus* spp.), mosquito fish (*Gambusia affinis*), red swamp crayfish (*Procambarus clarkii*), and signal crayfish (*Pacifastacus leniusculus*). Chytrid fungus (*Batrachochytrium dendrobatidis*) is a waterborne fungus that can decimate amphibian populations, and is considered a threat to California red-legged frog populations.

Information from the Mountains Restoration Trust (MRT) crayfish removal project indicates that California red-legged frogs are now present as far south as 0.45 miles downstream of the Highway 101 Bridge. In particular, MRT has observed five California red-legged frogs within the action area between the Agoura Road Bridge and the northern terminus of Lost Hills Road (J. Curti, MRT, pers. comm. 2017a, b, c). The species was thought to be extirpated from Las Virgenes Creek outside of the Upper Las Virgenes Creek Open space until July 2017 when MRT observed California red-legged frogs near their action area just north of the Highway 101 Bridge. MRT first observed California red-legged frogs in their action area in October 2017. The presence of the species in the study area is attributed to more plentiful precipitation during the winter of 2017 as well as MRT's non-native predator removal activities in the area.

California newt (*Taricha torosa torosa*)

The California newt is a California species of special concern. This subspecies is a stocky, medium-sized salamander with rough, grainy skin in the terrestrial phase, and no costal grooves. Terrestrial adults are yellowish-brown to dark brown above, pale yellow to orange below. The eyelids and the area below the eyes are lighter than the rest of the head. Aquatic larvae are light yellow above with two dark regular narrow bands on the back. This subspecies is endemic to California and found along the coast and coast range mountains from Mendocino County south to San Diego County in wet forests, oak forests, chaparral, and rolling grasslands. In southern California, it can be found in drier chaparral, oak woodland, and grasslands. California newts are known to occur in Malibu Creek and Cold Creek (DeLisle et al. 1986). This subspecies is threatened by introduction of non-native species and habitat loss.

Western pond turtle (*Clemmys marmorata pallida*)

The western pond turtle is considered a California species of special concern and protected species by the California Department of Fish and Wildlife (CDFW). The western pond turtle is found from sea level to approximately 6,600 feet, with the majority of populations below 4,300 feet in both permanent and intermittent aquatic habitats. Its distribution is fragmented by human activities, such as habitat alteration, grazing practices, recreational fishing, and introduction of exotic predators and competitors (Jennings and Hayes 1994). The species is thought to be in a general state of decline in an estimated 75 to 80 percent of its range. Threats to western pond turtles include climate change, introduction of non-native species, and habitat loss due development. Southwestern pond turtles formerly occurred along all major river systems within their present range. They are usually found near the banks or quiet backwaters of streams where the current is relatively slow and basking sites and refugia are available. However, they appear to be uncommon in heavily shaded areas, being concentrated where openings in the streamside canopy allow sufficient sunlight to facilitate basking. They have also been noted in small ponds and vernal pools in California. Southwestern pond turtles may move distances up to several hundred yards from drying pools to adjacent creeks (Service 1993).

Dagit and Albers (2009) determined that within the Santa Monica Mountains, it appears that western pond turtles are restricted to remnant populations with limited recruitment at most locations. The populations are isolated from one another and the potential for successful migration from one location to another is extremely limited. In 2009, southwestern pond turtles were found in eight sites, but only two locations have more than 35 individuals. Fewer than five individuals were captured in five locations and 16 individuals were found at one site. This pattern of disjunctive populations spread over a wide area, resulting in significant population decline, appears to be the current pattern in southern California (Bury and Germano 2008). Dagit and Albers' (2009) study area covered approximately 279 square miles of the Santa Monica Mountains and extended from Topanga Canyon on the east, to Wildwood Regional Park on the west. A variety of sites within the Malibu Creek watershed were also surveyed. Western pond turtles were observed in eight locations, including Malibu below the Rindge Dam, in 2009. DeLisle, et al. (1986) documented 13 locations with Western pond turtles in the Santa Monica

Mountains. Western pond turtles are also documented to occur with the study area in Las Virgenes Creek (CNDDB 2013).

California horned lizard (*Phrynosoma coronatum frontale*)
The California horned lizard is a California species of special concern. This native coastal subspecies is found in a variety of arid and mesic habitats such as coastal sand dunes, open scrub, and riparian habitats with friable soils. The species ranges from Shasta County southward along the edges of the Sacramento Valley into much of the South Coast Ranges, San Joaquin Valley, and Sierra Nevada foothills to northern Los Angeles, Santa Barbara and Ventura Counties (Jennings and Hayes 1994). The specialized diet and habitat requirements, site fidelity, and cryptic defense behavior make this species highly vulnerable. Commercial collecting, and habitat loss due to agriculture and urbanization are the main reasons cited for the decline of this taxa. Most surviving populations inhabit upland sites with limited optimal habitat. Many of these sites are on marginally suitable Forest Service land (Jennings and Hayes 1994). However, the most insidious threat to California horned lizard is the continued elimination of its food base by exotic ants. Argentine ants (Iridomyrmex humulis) colonize around disturbed soils associated with building foundations, roads and landfills, and expand into adjacent areas, eliminating native ant colonies (Ward 1987). Under these conditions California horned lizard populations have become increasingly fragmented, and have undergone the added stress of a number of other factors, including fire, grazing, off-road vehicles, domestic cats, and development (Jennings and Hayes, 1994). This taxon is unable to survive habitats altered by development, agriculture, off-road vehicle use, or flood control structures (Goldberg 1983).

This subspecies is known to occur within the study area (DeLisle et al. 1986, CNDDB 2013). The Service considers this subspecies to be rare in the study area.

Coastal whiptail (*Aspidoscelis tigris stejnegeri*)
The coastal whiptail is a California species of special concern. This subspecies is an active lizard of deserts and semiarid habitats, usually where plants are sparse. It prefers open areas where it can run to escape predators. Whiptails range from deserts to warmer, drier areas within montane pine forests. They are also found in woodland and streamside growth, and avoid dense grassland and thick growth of shrubs. Whiptails are usually found where the ground has firm soil and is rocky. The whiptail's diet consists of invertebrates including insect larvae, termites, grasshoppers, beetles, spiders, and scorpions, as well as other lizards (Stebbins 2003). The coastal whiptail is uncommon over much of its range in California, but it is abundant in the desert regions where suitable habitat is available (Zeiner *et al.* 1988). This subspecies is known to occur within the study area (DeLisle et al. 1986, CNDDB 2013).

Silvery legless lizard (*Anniella pulchra pulchra*)
The silvery legless lizard is a California species of special concern. This highly specialized fossorial lizard occurs in a variety of habitats but is quite specific in its

microhabitat requirements. It burrows beneath the leaf litter of shrubs or trees in loose, sandy soils and is generally absent from soils possessing a significant clay or silt component or that contain any degree of saturation, overlay a high water table or are subject to frequent disturbance (such as flooding). This subspecies is known to occur within the study area (DeLisle et al. 1986). The Service considers this subspecies to be rare in the study area.

Two-striped garter snake (*Thamnophis hammondii*)
The two-striped garter snake is a California species of special concern. This aquatic snake occurs in semi-permanent and permanent freshwater streams and ponds with bordering riparian woodland in central and southern California. It also frequents stock ponds and other human-made water sources. It can range well into xeric habitats such as chaparral adjacent to a watercourse. Habitat alteration, flood control activities and the prolonged drought of 1986-1991 have reduced populations throughout its range. Additionally, the introduction of non-native predators such as the largemouth bass and bullfrogs, may have reduced or eliminated populations from many areas. This species is known to occur within the study area (DeLisle et al. 1986).

Table 5. Known and Potentially Occurring Amphibians and Reptiles in the Study Area

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS
AMPIHBIANS			
Arboreal salamander	*Aneides lugubris*		
Black-bellied slender salamander	*Batrachoseps nigriventris*		
Ensatina	*Ensatina eschscholtzi*		
California newt	*Taricha torosa torosa*		CSC
California red-legged frog	*Rana draytonii*	FT	CSC
Bullfrog	*Lithobates catesbeiana*		
California treefrog	*Pseudacris regilla*		
Pacific chorus frog	*Pseudacris cadaverina*		
Western toad	*Bufo boreas halophilus*		
REPTILES			
Southwestern pond turtle	*Clemmys marmorata pallida*		CSC
Red-eared sliders	*Trachemys scripta elegans*		
California horned-lizard	*Phrynosoma coronatum frontale*		CSC
Coastal western whiptail	*Aspidoscelis tigris stejnegeri*		CSC
Side-blotched lizard	*Uta stansburiana*		
Silvery legless lizard	*Anniella pulchra pulchra*		CSC
Southern alligator lizard	*Elgaria multicarinata*		
Western fence lizard	*Sceloporus occidentalis*		
Western skink	*Eumeces skiltonianus*		
California black-headed snake	*Tantilla planiceps*		
California kingsnake	*Lampropelltis getulus californiae*		
California lyre snake	*Trimorphodon biscutatus vandenburghi*		

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS
Coast mountain kingsnake	*Lampropeltis zonata multifasciata*		
Coast patchnose snake	*Salvadora hexalepsis virgultea*		CSC
Gopher snake	*Pituophis melanoleucus*		
San Bernardino ringneck snake	*Diadophis punctatus modestus*		
Southern Pacific rattlesnake	*Crotalus viridis helleri*		
Southwestern blind snake	*Leptotyphlops humilis humilis*		
Coachwhip	*Masticophis flagellum piceus*		
Striped-racer	*Masticophis lateralis lateralis*		
California red-sided garter snake	*Thamnophis sirtalis infernalis*		
Two-striped garter snake	*Thamnophis hammondii*		CSC
Western yellow-bellied racer	*Coluber constrictor mormon*		
San Diego night snake	*Hypsiglena torquata klauberi*		

Special Status Codes

FT = Federally Threatened Species
CSC = California Species of Special Concern

Birds

Birds are abundant and diverse in the study area. We reviewed online databases (CNDDB 2013, Ebird 2018), literature and museum records and consulted with local experts to compile an inventory and discuss potential and historical species occurrences. We have identified 185 species which are either known to occur or have the potential to occur within the study area. Among the birds known to occur within the study area, six are listed as endangered or threatened on Federal and/or State lists (Table 6). In addition, 17 species known to occur within the study area are considered "sensitive" as they are listed on the following watchlist: California Species of Special Concern and State Fully Protected Species (CDFW 2011).

An important habitat type for birds in the study area is the palustrine system. The palustrine system, which occurs in every reach of the study area, provides important forage and cover for landbirds during all seasons. Dense willow and other riparian woodlands, especially adjoining water, are frequented by many migrant species in spring and fall, and somewhat smaller numbers of wintering passerines. Several regionally rare and declining birds nest in the study area in spring and summer, including regionally declining species of concern such as yellow warbler (*Dendroica petechia*) and yellow-breasted chat (*Icteria virens*) (CDFW and Point Reyes Bird Observatory (PRBO) 2001). The following summaries describe sensitive bird species known or expected to breed within the study area.

White-tailed kite (*Elanus caeruleus*)
The white-tailed kite is a California fully protected species. The white-tailed kite is a common to uncommon yearlong resident in coastal and valley lowlands. This species

inhabits herbaceous and open stages of most habitats in cismontane California. The white-tailed kite preys mostly on voles and other small, diurnal mammals, and occasionally on birds, insects, reptiles, and amphibians. It forages in undisturbed, open grasslands, meadows, farmlands and palustrine systems (Zeiner et al. 1990a). This regionally declining species is much rarer now than it was during its peak population years in the mid-1970's. Through the early 1980's, the white-tailed kite was seen regularly in or adjoining the study area, particularly in upland areas. The loss of open space in the project area has resulted in the decline of this species. This species is well known from study area ranging from Highway 101 at Las Virgenes Creek down to the Malibu Lagoon (Ebird 2018).

Cooper's hawk (*Accipiter cooperii*)
The Cooper's hawk is a California species of special concern. This species is a breeding resident throughout most of the wooded portion of the state. This species inhabits dense stands of live oak, riparian deciduous or other forest habitats near water. Cooper's hawks prey mostly on small birds, and occasionally small mammals, reptiles, and amphibians. It forages in broken woodland and habitat edges (Zeiner et al. 1990a). This species is threatened by habitat loss.

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)
The western distinct population of the western yellow-billed cuckoo was federally listed as threatened on October 3, 2014, and the State of California listed it as endangered. This subspecies is an uncommon to rare summer resident of riparian habitats of valley foothill and desert areas in scattered locations in California (Zeiner et al. 1990a). The western yellow-billed cuckoo was formerly much more common and widespread throughout lowland California, but its numbers have been drastically reduced by habitat loss. This subspecies has not been observed or documented breeding within the study area; however, presence of suitable nesting and foraging habitat is within the study area and this species should not be discounted despite being extremely rare.

Southwestern willow flycatcher (*Empidonax traillii extimus*)
The southwestern willow flycatcher was federally listed as endangered on February 27, 1995. The breeding range of the southwestern willow flycatcher includes Arizona, New Mexico, the southern portions of California, Nevada, and Utah, western Texas, southwestern Colorado, and extreme northwestern Mexico (Zeiner et al. 1990a). The southwestern willow flycatcher occurs in riparian habitats along rivers, streams, or other wetlands where dense growths of willows, coyote brush, arrowweed (*Pluchea* sp.), buttonbush (*Cephalanthus* sp.), tamarisk (*Tamarix* sp.), Russian olive (*Eleagnus* sp.) or other plants are present, often with a scattered overstory of cottonwoods. In the coastal portions of its range, southwestern willow flycatchers use willow-dominated riparian areas intermixed with cottonwoods, coyote brush and mule fat. Loss and modification of riparian habitats and brood parasitism by brown-headed cowbirds were the primary reasons for the species' decline that led to its listing. This subspecies has not been documented breeding within the study area; however, presence of suitable nesting and foraging habitat is within the study area and this should not be discounted despite being extremely rare.

Loggerhead shrike (*Lanius ludovicianus*)
The loggerhead shrike is a California species of special concern. Loggerhead shrikes are widely distributed across North America and are a common resident and winter visitor in lowlands and foothills throughout California. This species can be found in open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. The loggerhead shrike eats mostly large insects, but will also take small birds, mammals, reptiles and amphibians (Zeiner et al. 1990a). The widespread use of pesticides has become a threat to this species. This species is well known from study area ranging from Highway 101 at Las Virgenes Creek down to the Malibu Lagoon (Ebird 2018).

Least Bell's vireo (*Vireo belli pusillus*)
The least Bell's vireo is State and federally listed as endangered. It was federally listed as endangered on May 2, 1986. The least Bell's vireo nests and forages primarily in riparian woodland habitats. Typical nesting habitat consists of an understory of dense subshrub or shrub thickets dominated by sandbar willow (*Salix hindsiana*), mule fat, and saplings of other willow species. Historically, least Bell's vireos wintered in Mexico and ranged as far north as Tehama County, California. The current breeding distribution for the least Bell's vireo is restricted to southern California and northwestern Baja California. Widespread habitat loss has isolated most remaining populations of least Bell's vireos into small, widely dispersed subpopulations, which are concentrated in San Diego, Santa Barbara, and Riverside Counties. The decline in the numbers of the least Bell's vireo that led to its listing have been attributed, in part, to the combined, perhaps synergistic effects of the widespread loss of riparian habitats and brood-parasitism by the brown-headed cowbird (*Molothrus ater*).

This subspecies has not been documented breeding within the study area; however, presence of suitable nesting and foraging habitat is within the study area and this should not be discounted despite being extremely rare. A single male was documented singing within Reach 1 of the study area on the banks of the upper influence of the Malibu Lagoon on May 3, 2013 (Chris Sulzman, Biologist, R.A. Atmore & Sons, Inc. pers comm. 2013). This observation warrants follow up with surveys according to Service protocol for the least Bell's vireo.

Yellow warbler (*Dendroica petechial*)
The yellow warbler is a California species of special concern. This species is a common transient throughout the Santa Monica Mountains, and uncommon to locally common summer resident in lowland and foothill riparian woodlands. This species sometime, but rarely, winters in the lowlands. Yellow warblers mostly eat insects and spiders by gleaning and hovering in the upper canopy of deciduous trees and shrubs (Zeiner et al. 1990a). Similar to other riparian bird species, the decline in numbers of yellow warblers have been attributed, in part, to the combined, perhaps synergistic effects of the widespread loss of riparian habitats and brood-parasitism by the brown-headed cowbird. This riparian species is well known from study area ranging from Highway 101 at Las Virgenes Creek down to the Malibu Lagoon (Ebird 2018).

Yellow-breasted chat (*Icteria virens*)
The yellow-breasted chat is a California species of special concern. This species is an uncommon summer resident and migrant in coastal California. In southern California, the yellow-breasted chat breeds locally on the coast and very locally inland. Yellow-breasted chats eat insects and spiders by gleaning from foliage of shrubs and low trees (Zeiner et al. 1990a). Similar to other riparian bird species, the decline in the numbers of yellow-breasted chats have been attributed, in part, to the combined, perhaps synergistic effects of the widespread loss of riparian habitats and brood-parasitism by the brown-headed cowbird. This riparian species is well known from study area ranging from Highway 101 at Las Virgenes Creek down to the Malibu Lagoon (Ebird 2018).

Rufous-crowned sparrow (*Aimophila ruficeps canescens*)
The rufous-crowned sparrow is a California species of special concern. This species is a common resident of sparse mixed chaparral and coastal scrub habitats. It can be found in relatively steep, often rocky hillsides with grass and forb patches, as well as grassy slopes without shrubs, if rock outcrops are present. Rufous-crowned sparrows eat seeds, insects, spiders, grass and forb shoots. The decline of rufous-crowned sparrows can be attributed to the loss of its habitat. Brood-parasitism by the brown-headed cowbird has been documented as well for this species. This upland species is well known from study area ranging from Highway 101 at Las Virgenes Creek down to the Malibu Lagoon (Ebird 2018).

Table 6. Birds Potentially Occurring and Observed within the Study Area

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS
Ardeidae (Herons)			
American bittern	*Botaurus lentiginosus*		
Great blue heron	*Ardea herodias*		
Great egret	*Casmerodius albus*		
Snowy egret	*Egretta thula*		
Cattle egret	*Bubulcus ibis*		
Green-backed heron	*Butorides virescens*		
Anatidae (Swans, Geese and Ducks)			
Ross' goose	*Chen rossii*		
Canada goose	*Branta canadensis*		
Wood duck	*Aix sponsa*		
Green-winged teal	*Anas crecca*		
Mallard	*Anas platyrhynchos*		
Northern pintail	*Anas acuta*		
Cinnamon teal	*Anas cyanoptera*		
Blue-winged teal	*Anas discors*		
Northern shoveler	*Anas clypeata*		
Gadwall	*Anas strepera*		
American wigeon	*Anas penelope*		
Canvasback	*Aythya valisineria*		
Redhead	*Aythya americana*		

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS
Ring-necked duck	*Aythya collaris*		
Lesser scaup	*Aythya affinis*		
Common goldeneye	*Bucephala clangula*		
Bufflehead	*Bucephala albeola*		
Common merganser	*Mergus merganser*		
Hooded merganser	*Lophodytes cucullatus*		
Red-breasted merganser	*Mergus serrator*		
Ruddy duck	*Oxyura jamaicensis*		
Cathartidae (American Vultures)			
Turkey vulture	*Cathartes aura*		
Accipitridae (Kites, Hawks and Eagles)			
Osprey	*Pandion haliaetus*		CSC
White-tailed kite	*Elanus caeruleus*		SFP
Northern harrier	*Circus cyaneus*		CSC
Sharp-shinned hawk	*Accipiter striatus*		CSC
Cooper's hawk	*Accipiter cooperii*		CSC
Red-shouldered hawk	*Buteo lineatus*		
Red-tailed hawk	*Buteo jamaicensis*		
Rough-legged hawk	*Buteo lagopus*		
Falconidae (Caracaras, Falcons)			
Merlin	*Falco columbarius*		CSC
American kestrel	*Falco sparverius*		
Peregrine falcon	*Falco peregrinus*		SE, SFP
Prairie falcon	*Falco mexicanus*		CSC
Phasianidae (Grouse, Quail and Ptarmigan)			
California quail	*Callipepla californica*		
Rallidae (Rail, Gallinules and Coots)			
Virginia rail	*Rallus limicola*		
Sora	*Porzana carolina*		
Common moorhen	*Gallinula chloropus*		
American coot	*Fulica americana*		
Charadriidae (Plovers)			
Killdeer	*Charadrius vociferus*		
Scolopacidae (Sandpipers and relatives)			
Greater yellowlegs	*Tringa melanoleuca*		
Lesser yellowlegs	*Tringa flavipes*		
Solitary sandpiper	*Tringa solitaria*		
Spotted sandpiper	*Actitis macularia*		
Common snipe	*Gallinago gallinago*		
Laridae (Gulls and Terns)			
Heermann's gull	*Larus heermanni*		
Ring-billed gull	*Larus delawarensis*		
California gull	*Larus californicus*		
Herring gull	*Larus argentatus*		
Western gull	*Larus occidentalis*		
Caspian tern	*Sterna caspia*		

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS
Royal tern	*Sterna maxima*		
Elegant tern	*Sterna elegans*		
Common tern	*Sterna hirundo*		
Forster's tern	*Sterna forsteri*		
California least tern	*Sterna antillarum browni*	FE	SE, SFP
Black tern	*Chlidonias niger*		
Columbidae (Pigeons and Doves)			
Rock dove	*Columba livia**		
Band-tailed pigeon	*Columba fasciata*		
Mourning dove	*Zenaida macroura*		
Eurasian collared dove	*Streptopelia decaoto*		
Spotted dove	*Streptopelia chinensis**		
Psittacidae (Parrots and their allies)			
Black-hooded parakeet	*Nandayus nenday*		
Cuculidae (Cuckoos and their allies)			
Yellow-billed cuckoo	*Coccyzus americanus*	FT	SE
Greater roadrunner	*Geococcyx californianus*		
Tytonidae (Barn Owls)			
Barn owl	*Tyto alba*		
Strigidae (Owls)			
Great horned owl	*Bubo virginianus*		
Caprimulgidae (Nightjars)			
Lesser nighthawk	*Chordeiles acutipennis*		
Apodidae (Swifts)			
Black swift	*Cypseloides niger*		CSC
Vaux's swift	*Chaetura vauxi*		CSC
White-throated swift	*Aeronautes saxatalis*		
Trochilidae (Hummingbirds)			
Black-chinned hummingbird	*Archilochus alexandri*		
Anna's hummingbird	*Calypte anna*		
Costa's hummingbird	*Calypte costae*		
Rufous hummingbird	*Selasphorus rufus*		
Allen's hummingbird	*Selasphorus sasin*		
Alcedinidae (Kingfishers)			
Belted kingfisher	*Ceryle alcyon*		
Picidae (Woodpeckers)			
Red-breasted sapsucker	*Sphyrapicus ruber*		
Nuttall's woodpecker	*Picoides nuttallii*		
Downy woodpecker	*Picoides pubescens*		
Northern flicker	*Colaptes auratus*		
Tyrannidae (Tyrant Flycatchers)			
Olive-sided flycatcher	*Contopus borealis*		
Western wood-pewee	*Contopus sordidulus*		
Willow flycatcher	*Empidonax traillii*		SE
Hammond's flycatcher	*Empidonax hammondii*		
Pacific-slope flycatcher	*Empidonax difficilis*		

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS
Black phoebe	*Sayornis nigricans*		
Say's phoebe	*Sayornis saya*		
Ash-throated flycatcher	*Myiarchus cinerascens*		
Tropical kingbird	*Tyrannus melancholicus*		
Cassin's kingbird	*Tyrannus vociferans*		
Western kingbird	*Tyrannus verticalis*		
Alaudidae (Larks)			
Horned lark	*Eremophila alpestris*		
Hirundinidae (Swallows)			
Tree swallow	*Tachycineta bicolor*		
Violet-green swallow	*Tachycineta thalassina*		
Northern rough-winged swallow	*Stelgidopteryx serripennis*		
Cliff swallow	*Hirundo pyrrhonota*		
Barn swallow	*Hirundo rustica*		
Corvidae (Jays, Magpies, and Crows)			
Western scrub-jay	*Aphelocoma californica*		
American crow	*Corvus brachyrhynchos*		
Common raven	*Corvus corax*		
Paridae (Titmice)			
Oak titmouse	*Baeolophus inornatus*		
Aegithalidae (Bushtit)			
Bushtit	*Psaltriparus minimus*		
Sittidae (Nuthatches)			
Red-breasted nuthatch	*Sitta canadensis*		
Certhiidae (Creepers)			
Brown creeper	*Certhia americana*		
Troglodytidae (Wrens)			
Rock wren	*Salpinctes obsoletus*		
Bewick's wren	*Thryomanes bewickii*		
House wren	*Troglodytes aedon*		
Marsh wren	*Cistothorus palustris*		
Winter wren	*Troglodytes troglodytes*		
Muscicapidae (Thrushes)			
Golden-crowned kinglet	*Regulus satrapa*		
Ruby-crowned kinglet	*Regulus calendula*		
Blue-gray gnatcatcher	*Polioptila caerulea*		
Swainson's thrush	*Catharus ustulatus*		
Hermit thrush	*Catharus guttatus*		
American robin	*Turdus migratorius*		
Varied thrush	*Ixoreus naevius*		
Western bluebird	*Sialia mexicana*		
Wrentit	*Chamaea fasciata*		
Mimidae (Mockingbirds and Thrashers)			
Northern mockingbird	*Mimus polyglottos*		
California thrasher	*Toxostoma redivivum*		
Motacillidae (Wagtails and Pipits)			

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS
American pipit	*Anthus rubescens*		
Bombycillidae (Waxwings)			
Cedar waxwing	*Bombycilla cedrorum*		
Laniidae (Shrikes)			
Loggerhead shrike	*Lanius ludovicianus*		CSC
Sturnidae (Starlings)			
European starling	*Sturnus vulgaris**		
Vireonidae (Typical Vireos)			
Least Bell's vireo	*Vireo bellii pusillus*	FE	SE
Solitary vireo	*Vireo solitarius*		
Hutton's vireo	*Vireo huttoni*		
Warbling vireo	*Vireo gilvus*		
Emberizidae (Warblers, Sparrows, Blackbirds, and Orioles)			
Orange-crowned warbler	*Vermivora celata*		
Nashville warbler	*Vermivora ruficapilla*		
Yellow warbler	*Dendroica petechia*		CSC
Yellow-rumped warbler	*Dendroica coronata*		
Black-throated gray warbler	*Dendroica nigrescens*		
Townsend's warbler	*Dendroica townsendi*		
Hermit warbler	*Dendroica occidentalis*		
Blackpoll warbler	*Dendroica striata*		
Bay-breasted warbler	*Dendroica castanea*		
Black-and-white warbler	*Mniotilta varia*		
American redstart	*Setophaga ruticilla*		
Northern waterthrush	*Seirus noveboracensis*		
MacGillivray's warbler	*Oporornis tolmiei*		
Common yellowthroat	*Geothlypis trichas*		
Wilson's warbler	*Wilsonia pusilla*		
Yellow-breasted chat	*Icteria virens*		CSC
Summer tanager	*Piranga rubra*		CSC
Western tanager	*Piranga ludoviciana*		
Black-headed grosbeak	*Pheucticus melanocephalus*		
Lazuli bunting	*Passerina amoena*		
Rufous-sided towhee	*Pipilo erythrophthalmus*		
California towhee	*Pipilo crissalis*		
Chipping sparrow	*Spizella passerina*		
Lark sparrow	*Chondestes grammacus*		
Savannah sparrow	*Passerculus sandwichensis*		
Rufous-crowned sparrow	*Aimophila ruficeps canescens*		CSC
Fox sparrow	*Passerella iliaca*		
Song sparrow	*Melospiza melodia*		
Lincoln's sparrow	*Melospiza lincolnii*		
Swamp sparrow	*Melospiza georgiana*		
White-throated sparrow	*Zonotrichia albicollis*		
Golden-crowned sparrow	*Zonotrichia atricapilla*		
White-crowned sparrow	*Zonotrichia leucophrys*		

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS
Dark-eyed junco	*Junco hyemalis*		
Bobolink	*Dolichonyx oryzivorus*		
Red-winged blackbird	*Agelaius phoeniceus*		
Tricolored blackbird	*Agelaius tricolor*		CSC
Western meadowlark	*Sturnella neglecta*		
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*		
Brewer's blackbird	*Euphagus cyanocephalus*		
Brown-headed cowbird	*Molothrus ater*		
Hooded oriole	*Icterus cucullatus*		
Bullock's oriole	*Icterus bullockii*		
Fringillidae (Finches)			
Purple finch	*Carpodacus purpureus*		
House finch	*Carpodacus mexicanus*		
Lesser goldfinch	*Carduelis psaltria*		
American goldfinch	*Carduelis lawrencei*		
Passeridae (Old World Sparrows)			
House sparrow	*Passer domesticus**		

Special Status Codes

FE = Federally Endangered Species
FT = Federally Threatened Species
C = Candidate species for which the Service has on file sufficient information on the biological vulnerability and threats to support proposals to list and endangered or threatened
SE = State Endangered Species
CSC = California Species of Special Concern
SFP = California State Fully Protected Species
* = non-native species

Mammals

We reviewed literature and museum records and consulted with local experts to compile an inventory and discuss potential and historical species occurrences. The National Park Service has identified 45 species of mammals within the Santa Monica Mountains (Table 7). No endangered or threatened mammal species are known to occur within the study area; however, the following California species of special concern have been documented within the study area:

Ornate shrew (*Sorex ornatus*)

The ornate shrew is a California species of special concern. The ornate shrew can be found in valley foothills and montane riparian habitat, but occurs in a wide variety of woodland, chaparral, grassland, and emergent wetland habitats; however, details of its distribution are not well known. This subspecies warrants extensive research to further determine its status.

Pallid bat (*Antrozous pallidus*)

The pallid bat is a California species of special concern. In California, the species occurs throughout the State in a variety of habitats including low desert, oak woodland and

coastal redwood forests (Zeiner et al. 1990b). Pallid bats are colonial, with a typical colony containing 30-70 animals, although colonies of several hundred have been found. Pallid bats are primarily a crevice roosting species, and select daytime roosting sites where they can retreat from view. Common roost sites are rock crevices, old buildings, bridges, caves, mines, and hollow trees. Pallid bats forage primarily on large arthropods, caught on the ground or gleaned off vegetation. Although the status of pallid bats has not been investigated, bat biologists have noted a definite decline in populations in recent years in California. Widespread use of insecticides may have also reduced insect abundance and potentially poisoned some bats (Williams 1986). This species has been detected within the study area in Malibu Creek State Park during bat surveys conducted from 2002 to 2004 for the National Park Service (Brown and Berry 2005).

Yuma myotis (*Myotis yumanensis*)
The Yuma myotis is a California species of special concern. This bat is common in California and found throughout the State except in the Mojave and Colorado deserts of southeastern California. This species occupies a variety of habitats. It is found in open forests and woodlands, usually feeding over water. The Yuma myotis emerges soon after sunset and feeds on a variety of flying insects low to the ground. This species roosts in buildings, mines, caves, or crevices (Zeiner et al. 1990b). Yuma myotis forms large maternity colonies of several thousand in buildings, caves and bridge structures. This species mates in the fall and bears one young between late May to mid-June. The Yuma myotis has been found roosting with other bats including pallid and Mexican free-tailed bats. Reasons of decline for this species include loss of suitable roosting sites habitat, including destruction and disturbance, and pesticides. Widespread use of insecticides may have also reduced insect abundance and potentially poisoned some bats (Williams 1986). This species probably forages over the study area and there may be roosting habitat present. Brown and Berry (2005) state that this species is “acoustically ubiquitous” and are the “most common” bat throughout Santa Monica Mountains; therefore, it is likely this species occurs in the Study Area.

Townsend’s big-eared bat (*Corynorhinus townsendii*)
The Townsend’s big-eared bat is a California species of special concern. This bat is found in scrub and woodland habitats throughout the Pacific states, but details of its distribution are not well known. Once considered common, the Townsend’s big-eared bat is now considered uncommon in California (Zeiner et al. 1990b). Habitat for these bats must include appropriate roosting, maternity, and hibernacula sites free from disturbance by humans. A single visit by humans can cause the bats to abandon a roost (Williams 1986). Widespread use of insecticides may have also reduced insect abundance and potentially poisoned some bats (Williams 1986). Brown and Berry (2005) did not detect these species during surveys from 2002 through 2004 within the Santa Monica Mountains; however, they did say this species is difficult to detect and it could occur within the Study Area as residents or vagrants.

Western mastiff bat (*Eumops perotis californicus*)
The western mastiff bat is a California species of special concern. This large bat is an uncommon inhabitant of scrub and open woodlands from San Francisco Bay south

through Baja California and mainland Mexico (Zeiner et al. 1990b). Incidental information suggests that this species has undergone significant declines in recent years (Williams 1986). Reasons for the species decline are only conjecture. Extensive loss of habitat because of urbanization of coastal basins, marsh drainage, and cultivation of major foraging areas are likely factors. Widespread use of insecticides may have also reduced insect abundance and potentially poisoned some bats (Williams 1986). This subspecies probably forages over the study area and there may be roosting habitat present.

Ringtail (*Bassariscus astutus*)
The ringtail is a California fully protected species. This secretive, nocturnal species in the raccoon family typically inhabits woodland and adjacent scrub habitats on rocky slopes near a permanent water source (Zeiner et al. 1990b). Its habitat requirements are den sites among boulders or in hollow trees and sufficient food in the form of rodents and other small animals. Urbanization, loss and degradation of riparian communities have depleted and extirpated some populations of ringtail (Williams 1986). This nocturnal secretive species is known from the Study Area based on a roadkill specimen found along Las Virgenes Road in 2012. It was also documented within Malibu Creek below Century Dam (Pers. obs. Tom Clancey, Rock Climber, 2018).

American badger (*Taxidea taxus*)
The American badger is California species of special concern. This large, carnivorous animal is widely distributed throughout California in arid grasslands and scrub habitats containing friable soils and relatively open, uncultivated ground where it preys primarily on rodents (Zeiner et al. 1990b). Most populations in southern California lowlands have been extirpated by direct killing and urban and agricultural expansion. This species is known to occur in the study area but is not expected to occur at the barriers including the Rindge Dam.

Table 7. Mammals Known and Potentially Occurring within the Study Area

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS
Marsupials			
Virginia opossum*	*Didelphis virginiana*		
Soridae (shrews and moles)			
Broad-footed mole	*Scapanus latimanus*		
Ornate shrew	*Sorex ornatus*		CSC
Desert shrew	*Notiosorex crawfordi*		
Vespertilionidae (mouse-eared bats)			
Pallid bat	*Antrozous pallidus*		CSC
Big brown bat	*Eptesicus fuscus*		
Western red bat	*Lasiurus borealis*		
Yuma myotis	*Myotis yumanensis*		CSC
California myotis	*Myotis californicus*		
Western pipistrelle	*Pipistrellus hesperus*		

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS
Hoary bat	*Lasiurus cinereus*		
Townsend's big-eared bat	*Plecotus townsendii*		CSC
Molossidae (free-tailed bats)			
Mexican freetail bat	*Tadarida brasiliensis*		
Western mastiff bat	*Eumops perotis californicus*		CSC
Leporidae (rabbits)			
Brush rabbit	*Sylvilagus bachmani*		
Audubon cottontail	*Sylvilagus audubonii*		
Black-tailed jack rabbit	*Lepus californicus*		
Sciuridae (squirrels and relatives)			
Merriam's chipmunk	*Tamias merriami*		
California ground squirrel	*Spermophilus beecheyi*		
Western gray squirrel	*Sciurus griseus*		
Fox squirrel*	*Sciurus niger*		
Geomyidae (gophers)			
Botta's pocket gopher	*Thomomys bottae*		
Heteromyidae (kangaroo rats)			
Pacific kangaroo rat	*Dipodomys agilis*		
Cricetidae (mice, woodrats, and voles)			
Western harvest mouse	*Reithrodontomys megalotis*		
California mouse	*Peromyscus californicus*		
California pocket mouse	*Chaetodipus californicus*		
Deer mouse	*Peromyscus maniculatus*		
Dusky-footed woodrat	*Neotoma fuscipes*		
Desert woodrat	*Neotoma fuscipes*		
Brush mouse	*Peromyscus boylii*		
Cactus mouse	*Peromyscus eremicus*		
Pinon mouse	*Peromyscus truei*		
California vole	*Microtus californicus*		
Muskrat*	*Ondatra zibethicus*		
Muirdae (rats)			
Black rat*	*Rattus rattus*		
Norway rat*	*Rattus norvegicus*		
House mouse*	*Mus musculus*		
Canidae (foxes and coyotes)			
Coyote	*Canis latrans*		
Gray fox	*Urocyon cinereogenteus*		
Red fox*	*Vulpes vulpes*		
Domestic dog*	*Canis familiaris*		
Procyonidae (raccoon and ringtail)			
Ringtail	*Bassariscus astutus*		SFP
Raccoon	*Procyon lotor*		
Mustelidae (weasels and relatives)			
Long-tailed weasel	*Mustela frenata*		
American badger	*Taxidea taxus*		CSC
Western spotted skunk	*Spilogale gracilis*		

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS
Striped skunk	*Mephitis mephitis*		
Felidae (cats)			
Mountain lion	*Felis concolor*		
Bobcat	*Felis rufous*		
Domestic cat*	*Felis catus*		
Cervidae (elk and deer)			
Mule deer	*Odocoileus hemionus*		

*Denotes non-native species

Special Status Codes

CSC = California Species of Special Concern
SFP = California State Fully Protected Species

IMPACTS OF THE PREFERRED ALTERNATIVE ON BIOLOGICAL RESOURCES

The study area and its restoration are complex, and any effort to rehabilitate the Malibu Canyon drainage needs to be based on a sound understanding of the ecological benefits and drawbacks of the dam removal alternatives. The Rindge Dam disrupts the natural river course and flow, redirects river channels, transforms the floodplain and disrupts river continuity. In addition to interrupting the natural flow of water, the Rindge Dam and some of the upstream barriers also limit the natural recolonization of riparian plant species downstream of the dam by inhibiting the dispersal of plant propagules such as seeds, stolens, and roots buried in sediments trapped behind the dam and barriers. Dam removal can enable the return of native species by restoring riverine and palustrine habitats on which native species depend. Dam removal should promote the recovery of southern steelhead.

Sediment transport in a river is vital to riparian and riverine habitats and species. Most free-flowing rivers are characterized by wide fluctuations in flow, which affect sediment transport and create unique and diverse habitats for species. Large flows should serve to erode small, nutrient rich sediments from a river and its shoreline, depositing this material downstream and in the Malibu Lagoon. These same flows should transport and redistribute larger sediments and boulders, creating new and more diverse habitats for feeding, spawning, and breeding of aquatic and riparian species.

The preferred alternative would result in both short- and long-term effects within the study area. Examples of short-term direct impacts to wildlife are mortality, displacement, and disturbance during project implementation. Although these effects are likely to occur under the preferred alternative, the scope of these effects is difficult to quantify. Indirect short-term effects to terrestrial and aquatic habitats include temporary degradation with large quantities of sediment, litter, vehicular pollutants, dust, and noise. Under the preferred alternative, we expect negative impacts to the area within the vicinity of the Rindge Dam, as well as at upstream barriers and their associated riparian areas.

Most of the impact of dam removal under the preferred alternative will occur at the dam itself and within a few miles downstream and upstream of the dam. Although most of the impacts will occur in these areas, the entire study area will be affected. Areas of special concern include those where listed species occur such the least Bell's vireo, California red-legged frog, southern steelhead, and tidewater goby.

We anticipate the following effects to wildlife species and their habitats:

- Mortality and injury of wildlife from during earth-moving, demolition, vehicular access, and worker foot traffic.

- Displacement and/or disruption of breeding and feeding behavior of terrestrial species resulting from removal of habitats during project construction. This effect applies primarily to those aspects of the project which include habitat modifications, such as sediment deposition and upstream barrier removal.

- Work activities, including noise and vibration, may harass wildlife, causing individual animals to leave the work areas and displace them from nesting, foraging, and roosting areas. This disturbance may increase the potential for predation and desiccation for aquatic species.

- Aquatic species may be entrained by pump intakes, if such devices are used to dry out work areas.

- Some potential exists for disturbance of habitat to cause the spread or establishment of non-native invasive species, such as New Zealand mud snail, giant reed or salt cedar (*Tamarix* spp.). Improper disposal of giant reed after removal could also result in additional spreading of this exotic invasive species.

- Native aquatic species may be harassed and suffer mortality from predation. If water that is impounded during or after work activities creates favorable habitat for non-native predators, such as bullfrogs, crayfish, and centrarchid fishes, native aquatic species may suffer abnormally high rates of predation. Additionally, any time frogs or fish are concentrated in a small area at unusually high densities, native predators such as herons, egrets, opossums, and raccoons may feed on them opportunistically.

- Trash left during or after project activities could attract predators to work sites, which could, in turn, harass or prey on sensitive species. For example, raccoons are attracted to trash and also prey opportunistically on frogs, fish or bird eggs.

- Accidental spills of hazardous materials or careless fueling or oiling of vehicles or equipment could degrade water quality or upland habitat to a degree where the wildlife is adversely affected or killed.

- Work in live streams or in floodplains could cause unusually high levels of siltation downstream. This siltation could smother eggs and larvae of aquatic species and alter the quality of the habitat to the extent that use by individuals of many species is temporarily precluded.

- The potential exists for uninformed workers to intentionally or unintentionally harass, injure, harm, or kill wildlife.

The Corps proposes to divert water around work areas at the Rindge Dam and some of the upstream barriers. Specific adverse impacts of the water/diversion operations include, but are not necessarily limited to, the following:

1) Disturbing instream habitat through the periodic construction of a pilot channel or berm to direct flows into existing surface diversion;

2) Impeding the upstream or downstream movement of fish and other aquatic species, either by dewatering the channel below the surface diversion, or creating a physical impediment to fish passage as a result of the construction of a diversion berm;

3) Entraining fish (particularly juvenile fish) into the existing surface diversion, or impinging them against the diversion screen, when the fish screen is not properly installed or maintained;

4) Lowering the surface water level in the river channel, and in some cases de-watering portions of the channel, below the surface diversion;

5) Lowering the surface water level in the river channel, and in some cases completely de-watering the channel, or isolating pools upstream of the surface diversion.

DISCUSSION AND CONCLUSION

Overall long-term benefits of removing the Rindge Dam and upstream barriers include re-opening approximately 15 miles of steelhead migration and spawning habitat not now available. Although fish passage is the driving element, dam removal will also provide an important benefit by restoring the fluvial processes upstream and downstream of the project area. The downstream channel will benefit from the increased transport of sand and gravel and the habitat condition should greatly improve over time. An increase in the sediment supply will help restore the lagoon and increase intertidal habitat available for tidewater gobies and southern steelhead. Eventually, a natural free-flowing river would result in normal sediment deposition downstream that could lead to better habitat for sensitive species such as the southwestern willow flycatcher and least Bell's vireo.

Case studies of dam and barrier removals reveal marked changes in community structure in formerly impounded river reaches. Typically, this involves the reduction of species adapted to still-water conditions such as carp, pollution-tolerant macroinvertebrates and some aquatic plants (Kanehl et al. 1997). It is generally assumed that waterfowl and raptors also will become less common, although one case study (Edwards Dam Removal) found that bald eagle abundance in the formerly impounded reach actually increased (American Rivers 2013). Offsetting these losses, fish and wildlife diversity in formerly impounded reaches has been shown to dramatically increase, and this increase has come about as a result of recolonization by species that prefer clean, flowing water (Kanehl et al. 1997). This probably results from changes in the nature of instream habitat such as restoration of a natural flow regime and increases in rocky substrates, fish cover, and the formation of pools and riffles.

RECOMMENDATIONS

In the event that Rindge Dam and upstream barrier removal proceeds, we recommend the following actions that may benefit plant, fish and wildlife resources:

- Surveys for least Bell's vireo and southwestern willow flycatcher should be conducted at locations in the study area where construction activity would take place for the duration of the project (i.e., vicinity of dam and upstream barriers).

- A monitoring program for assessing nesting bird activity should be developed for the project, particularly in the vicinity of dam and upstream barriers.

- Surveys for bats should be conducted in the vicinity of the dam or anywhere project activities could affect them.

- A giant reed eradication project should be initiated prior to initiation of a dam removal alternative. Tamarisk and other non-native invasive plants encountered should also be removed. Measures to prevent the spread or introduction of these species, such as avoiding areas with established native vegetation, restoring disturbed areas with native species, and post-project monitoring and control of exotic species, should be developed.

- An intensive eradication program for non-native species (e.g. bullfrogs, bass, carp, *etc*.) should be completed at locations where water is pooled prior to initiation of a dam and barrier removal. Eradicating these species from the source locations will limit any downstream relocation. Eradication of non-native species may result in lower mortality to native species.

- A relocation plan for the southern steelhead, Pacific lamprey, southwestern pond turtle, two-striped garter snake, California red-legged frog, and other special status species should be developed and initiated prior to initiation of a dam and

barrier removal activities. Other native species should also be considered for possible relocation out of the project area.

- Focused surveys for Pacific lampreys should be conducted during any de-watering activities occurring at the Rindge Dam.

- A viability assessment should be developed to consider translocating Pacific lamprey back into Malibu Creek.

- Revegetation and stream restoration programs should be developed prior to the start of any dam or barrier removal activities. A native plant nursery should be developed at or near the project site to provide a source of plants and trees for revegetation. Cultivation of locally native tree species should be initiated as soon as possible to help incorporate multiple age class plants in the revegetation plan.

- A wildlife care facility should be contracted to treat sick, injured, or orphaned animals found in the construction areas.

- Mortality and injury of species within the construction areas could be reduced by minimizing and clearly demarcating the boundaries of the construction areas and equipment access routes, and locating staging areas outside of sensitive areas.

- A 300-foot buffer should be established around any active bird nests detected in work areas.

- Improper handling, containment, or transport of individual species should be reduced or prevented by the use of qualified biologists.

- The creation of nuisance ponds in the project area that may render native species vulnerable to predatory species should be avoided.

- Best management practices should be implemented and the area to be disturbed should be kept to the minimum necessary to reduce the amount of sediment that is washed downstream as a result of project activities.

- All roads constructed for the project should be decommissioned except those needed for future project maintenance.

- Project workers should be informed through a worker education program of the presence of species and the measures that are being implemented to protect them during project activities. The program should describe: the importance of keeping the project site free of trash to avoid attracting predators to the project site which could harass or prey on aquatic species; on-site signage, printed material with sensitive species information; and worker orientations. Project workers should also be informed of the importance of preventing hazardous materials from entering the environment. Locating staging and fueling areas a minimum of 65

feet from riparian areas or other water bodies, and having an effective spill response plan in place could reduce harmful effects and mortality to wildlife.

- Regular monitoring of benthic invertebrates, amphibians, reptiles, fishes, birds, vegetation, and wetlands should be considered within the study area and Malibu Lagoon. Monitoring may be limited to specific sensitive species for each major habitat type. Monitoring duration should be based on the project duration, habitat types, and species.

- Because federally listed species and critical habitat may be affected by the proposed alternative, the Corps should consult with the Service and National Marine Fisheries Service pursuant to Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.)*. Informal consultation or conferences may be conducted to exchange information and to resolve conflicts with respect to listed species prior to a written request for formal Section 7 consultation.

CONCLUSION

We believe that the proposed Malibu Canyon Restoration project presents an important opportunity to restore native habitats and ecosystem functions in the Malibu Canyon on a watershed scale, and thereby contribute to the recovery of listed and sensitive species. The project will substantially benefit current weak stocks of southern steelhead, which spawn in the lower Malibu Creek. We offer our support for the project and believe the Corps should move forward with the preferred alternative.

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Final Fish and Wildlife Coordination Act Report

Malibu Canyon Ecosystem Restoration Feasibility Study

Los Angeles County, California

2018-CPA-0027

Responses to Recommendations

Los Angeles District

U.S. Army Corps of Engineers

April 23, 2018

(Updated July 2020)

GENERAL

Section 662(b) of the Fish and Coordination Act (FWCA) of 1958 (Public Law 85-624; U.S.C. 661-666) requires the U.S. Army Corps of Engineers' (USACE) to include reports and recommendations in authorization documents and to give full consideration to the reports and recommendations of fish and wildlife agencies (such as the U.S. Fish and Wildlife Service, USFWS). The USACE does not agree with some of the recommendations provided in the Final Coordination Act Report (CAR). Those differences are discussed below as required by the FWCA. Those recommendations not considered for implementation will not be included in the Final Integrated Report or in project design and construction for reasons given below. Those recommendations that the USACE is in agreement with be incorporated into the applicable design elements during the upcoming Preliminary Engineering Design (PED) Phase of the project.

Recommendations from the Final CAR are bulleted below, followed by the USACE's responses.

RECOMMENDATIONS

- Surveys for least Bell's vireo and southwestern willow flycatcher should be conducted at locations in the study area where construction activity would take place for the duration of the project (i.e., vicinity of dam and upstream barriers).

Partial agreement; a pre-construction survey shall be conducted for least Bell's vireo. Surveys will not be conducted for southwestern willow flycatcher as the species is not present in the study area and suitable habitat does not occur within the study area.

- A monitoring program for assessing nesting bird activity should be developed for the project, particularly in the vicinity of dam and upstream barriers.

Disagree; tree removal shall be conducted in the spring to avoid disruption to bird nesting activities. Conducting a monitoring program for bird activity is not related to project impacts and would end up being basic research.

- Surveys for bats should be conducted in the vicinity of the dam or anywhere project activities could affect them.

Disagree, bats are only considered to be present during night-time foraging and would not be affected by daytime construction activities.

- A giant reed eradication project should be initiated prior to initiation of a dam removal alternative. Tamarisk and other non-native invasive plants encountered should also be removed. Measures to prevent the spread or introduction of these species, such as avoiding areas with established native vegetation, restoring disturbed areas with native species, and post-project monitoring and control of exotic species, should be developed.

Partial agreement; non-native plants would be removed from areas directly impacted by construction activities, including dam removal and barrier removal activities. Those areas would be reestablished with native vegetation in programs that would include post-project monitoring and control of exotic species. Vegetated areas outside the construction footprint would not be subject to non-native eradication by the project, but would still be performed by State Parks as part of their ongoing maintenance programs.

- An intensive eradication program for non-native species (e.g. bullfrogs, bass, carp, *etc*.) should be completed at locations where water is pooled prior to initiation of a dam and barrier removal. Eradicating these species from the source locations will limit any downstream relocation. Eradication of non-native species may result in lower mortality to native species.

Disagree; this type of program is outside the scope of the proposed project.

- A relocation plan for the southern steelhead, Pacific lamprey, southwestern pond turtle, two-striped garter snake, California red-legged frog, and other special status species should be developed and initiated prior to initiation of a dam and barrier removal activities. Other native species should also be considered for possible relocation out of the project area.

Partial agreement; a relocation plan will be developed for southern California steelhead. Relocation plans for Pacific lamprey, southwestern pond turtle, and two-striped garter snake are not needed due to the absence of these species from the project area. Pre-construction surveys will be conducted for the presence of red-legged frog in the upper reaches of Las Virgenes Creek. Red-legged frogs have been recently detected in this reach with the possibility of this species moving into the upper barrier removal area[s] (LV-4) by the time project construction begins in the year 2025. If detected, a relocation and avoidance plan will be prepared in consultation with the USFWS.

- Focused surveys for Pacific lampreys should be conducted during any de-watering activities occurring at the Rindge Dam.

Disagree; past focused surveys have failed to show the presence of this species. In addition, surveys for steelhead, conducted annually, have failed to locate any Pacific lamprey. Pacific lamprey is considered to be absent and surveys are not required.

- A viability assessment should be developed to consider translocating Pacific lamprey back into Malibu Creek.

Disagree, this type of research effort is outside the scope of the proposed project.

- Revegetation and stream restoration programs should be developed prior to the start of any dam or barrier removal activities. A native plant nursery should be developed at or near the project site to provide a source of plants and trees for revegetation. Cultivation of locally native tree species should be initiated as soon as possible to help incorporate multiple age class plants in the revegetation plan.

Agree; although the specifics may vary from those recommended, the intent is the same.

- A wildlife care facility should be contracted to treat sick, injured, or orphaned animals found in the study area.

Disagree, this type of effort is outside the scope of the proposed project and would involve treatment of animals whose injuries are totally unrelated to the project (e.g. road incidents with non-construction traffic).

- Mortality and injury to species within the project site could be reduced by minimizing and clearly demarcating the boundaries of the project areas and equipment access routes and locating staging areas outside of sensitive areas.

Agree; recommendation will be implemented.

- Establish a 300-foot buffer around any active bird nests detected in work areas.

Disagree; vegetation removal will take place in early spring prior to the bird nesting season. Remaining trees would be outside the project area and would not be affected. If nests are detected in vegetated areas adjacent to the construction site, an appropriate buffer will be imposed depending on the species discovered in consultation with the USFWS.

- Improper handling, containment, or transport of individual species should be reduced or prevented by the use of qualified biologists.

Agree; qualified biologists will be a requirement for surveying, monitoring, and animal removal activities.

- The creation of nuisance ponds in the project area that may render native species vulnerable to predatory species should be avoided.

Agree; deep water and slack current nuisance ponds will not be created in the dam and impounded sediment project area. Pre-dam pools and riffles will be exposed within the former dam and impounded sediment footprint at or soon after the end of construction. Any constructed pools will provide momentary resting opportunities for native species, with small footprints and relatively shallow depths. Existing natural ponds downstream of the dam site will not be modified by the project.

- Best management practices should be implemented and the area to be disturbed should be kept to the minimum necessary to reduce the amount of sediment that is washed downstream as a result of project activities.

Agree; BMP's will be implemented to minimize the amount of sediment washed downstream.

- All roads constructed for the project should be decommissioned except those needed for future project maintenance.

Agree; construction roads would be removed and revegetated with the exception of a single maintenance road.

- Project workers should be informed through a worker education program of the presence of species and the measures that are being implemented to protect them during project activities. The program should describe: the importance of keeping the project site free of trash to avoid attracting predators to the project site which could harass or prey on aquatic species; on-site signage, printed material with sensitive species information; and worker orientations. Project workers should also be informed of the importance of preventing hazardous materials from entering the environment. Locating staging and fueling areas a minimum of 65 feet from riparian areas or other water bodies, and having an effective spill response plan in place could reduce harmful effects and mortality to wildlife.

Agree; a worker education program would be included in the project to emphasize special status species, water quality protection measures, and overall environmental considerations. Staging and fueling areas may not be able to be located a minimum of 65 feet from riparian areas due to the site layout, but efforts will be made to locate them as far as practicable.

- Regular monitoring of benthic invertebrates, amphibians, reptiles, fishes, birds, vegetation, and wetlands should be considered within the study area and Malibu Lagoon. Monitoring may be limited to specific sensitive species for each major habitat type. Monitoring duration should be based on the project duration, habitat types, and species.

Disagree, this type of research effort is outside the scope of the proposed project.

- Because federally listed species and critical habitat may be affected by the proposed alternative, the Corps should consult with the Service and National Marine Fisheries Service pursuant to Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.)*. Informal consultation or conferences may be conducted to exchange information and to resolve conflicts with respect to listed species prior to a written request for formal Section 7 consultation.

Agree; the USACE has conducted an informal consultation process using the Technical Advisory Committee and telephone conversations with both USFWS and National Marine Fisheries Service (NMFS). The USACE conducted formal consultation with the NMFS for potential impacts to southern California steelhead and its designated critical habitat. Conservation included in the Biological Opinion prepared by the NMFS will be included in project design and construction. Informal consultation was concluded with the USFWS in October 2017. Consultation is subject to reinitiation should changed conditions at the site warrant further review and consultation, including the appearance on site of species considered to be absent, new or modified listings of species, and/or project design modifications that may result in impacts not considered in the original consultations.