ATTACHMENT TO APPENDIX A: PROTECTION MEASURES

The U.S. Fish and Wildlife Service based its non-jeopardy/non-adverse modification biological and conference opinion for the Statewide Restoration Effort on the implementation of all the protection measures incorporated into the Statewide Restoration Effort as described in the Programmatic Biological and Conference Opinion (PBO). The protective measures include eligibility criteria, prohibited activities, self-imposed take limits, General Protective Measures (GPMs) and species protective measures. All of which are repeated here as an attachment to Appendix A for ease of access.

Eligibility Criteria (Requirements for Coverage under PBO)

All projects must meet the definition of a restoration project and be consistent with USFWS recovery plans or recovery related documentation for Covered Species.

- A restoration project is defined as an eligible project type and relevant protection measures that will result in a net increase in aquatic, riparian, floodplain, wetland, or coastal dune resource functions and/or services through implementation of the eligible project types, relevant protection measures, and design guidelines.
- Not every restoration activity will benefit all affected species; at the same time, the goal for each restoration project will be to result in no net loss of waters of the United States and only discountable adverse effects to federally listed species and their critical habitats through implementation of relevant protection measures and/or offsetting habitat restoration or enhancement as part of the project design and within the project footprint, when feasible.

Prohibited Activities

The following activities are not within the scope of the Proposed Restoration Effort, were not analyzed in the PBO, and will require separate consultation:

1. Use of gabion baskets.
2. Use of cylindrical riprap (e.g., Aqualogs).
3. Construction of permanent dams or concrete-lined channels of any sort.
4. Use of chemically treated timbers used for grade or channel stabilization structures, bulkheads, or other instream structures.
5. Activities that substantially disrupt the movement of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the project areas.
6. Elimination of a riffle, pool, or riffle/pool complex that is not replaced/enhanced elsewhere by the project.
7. New water diversions that would cause listed aquatic species stranding (i.e., those without controls that provide functional separation of the species from the project supported by the new diversion), except to temporarily dewater a project site (some water conservation projects are allowed under the Proposed Restoration Effort [Section 2.1.3.5, *Water Conservation Projects for Enhancement of Fish and Wildlife Habitat])* or for

diversions associated with delivery or conveyance to and within managed wetlands as described in Section 2.1.3.9.

8. Installation of flashboard dams, head gates, or other mechanical structures that would cause listed aquatic species stranding are generally prohibited; however, there are exceptions for certain projects that require them to meet ecological goals (e.g., storage projects to reduce low flow stream diversions [Section 2.1.3.5, *Water Conservation Projects for Enhancement of Fish and Wildlife Habitat*], off-channel/side-channel, managed floodplain, and managed wetland habitat) and for the required replacement of legacy structures (Section 4.3.2 *Removal of Small Dams, Tide gates, Flood gates, and Legacy Structures*).
9. Creation or potential creation of a barrier to anadromous fish passage, as determined by the NMFS fish passage guidelines (including any associated maintenance activities, or lack thereof).
10. Use of excess riprap bank protection or hard armoring of banks, other than the minimum amount needed to achieve project goals, as determined by the Lead Action Agency in coordination with the USFWS Field Office.
11. Installation of infiltration galleries.
12. Managed surrogate floodplain and managed returned flows that do not allow for volitional movement (ingress and egress) of fish to the main channel (up and/or downstream).
13. Projects that would result in a net loss of aquatic resource functions and/or services.
14. Projects that would result in a net loss of vernal pool habitat.
15. Projects that would result in a net loss of designated critical habitat function for any federally listed species. Loss of function is considered in the context of the physical and biological features as described in the respective critical habitat designation and includes abiotic and biotic resources and conditions necessary to support one or more life processes of the species.
16. Projects overlapping the current range of amphibians endemic to the Sierra Nevada (i.e., Sierra Nevada yellow legged frog, mountain yellow-legged frog (Northern California DPS), and Yosemite toad) that would extend the range of predatory fish (e.g., salmonids or centrarchids); because amphibians in the Sierra Nevada evolved mostly in the absence of predatory fish, the recovery of amphibians in the Sierra Nevada can be hindered by the presence of predatory fish.

Self-Imposed Annual Take Limits

The Proposed Restoration Effort includes a series of sideboards under the criteria for eligible project types (Section 2.1.1 *Prohibited Activities,* and Section 2.1.3 *Eligible Project Types and Design Guidelines*); the administrative process for proposed restoration projects to be covered under the PBO (Section 2.1.2, *Administration of the PBO* and Figure 2); protection measures (Section 2.1.5, *Protection Measures),* and self-imposed limits for incidental take of animal species with an LAA determination.

For a restoration project to be covered under the PBO, it will have to meet the criteria outlined in this document. After the Lead Action Agency receives and reviews an ESA Section 7(a)(2) Review Form and finds it sufficient, it will be provided to the respective USFWS Field Office. The USFWS Field Office will implement its authority under Section 7 of the ESA to determine whether the proposed project is compliant with the PBO using the information provided in the ESA Section 7(a)(2) Review Form and any additional communication with the Lead Action Agency and/or Project Proponent and/or site visits (Figure 2). The self-imposed take limits for covered animal species are annual (January 1 through December 31) and range wide. Once a take limit has been reached for a given covered animal species, this consultation is no longer available to cover proposed restoration projects that adversely affect that species, until the following year, starting January 1.

Due to the multiple sideboards in the administrative process and the Proposed Restoration Effort itself, potential take of Covered Species will be avoided and minimized while meeting restoration project goals, and as site conditions and technical constraints allow. Incidental take of a Covered Species may occur during project construction (i.e., mostly in the short term), but the overall goal of these restoration projects is to recover threatened and endangered species and their habitats, including critical habitat when designated. Potential short-term incidental take of Covered Species will be offset by the long-term beneficial effects to Covered Species from habitat restoration, habitat enhancement, and increased ecosystem services that further support the recovery of Covered Species.

As a part of the project description, the PBA incorporated into the Proposed Restoration Effort self-imposed limits on the amount of incidental take that will be authorized for the effort. The following incidental take described below for each covered animal species with an LAA determination provides a limit that will not be exceeded on an annual basis under the Effort. Project Proponents will work with the respective USFWS Field Office during the ESA Section 7(a)(2) Review Form process to minimize take at the project level and avoid disproportionately affecting local populations. In some cases, proposed restoration projects may require independent consultation instead of programmatic coverage due to local effects being too great or if the project does not meet the intent of the Proposed Restoration Effort.

Once an individual take limit is reached, the Proposed Restoration Effort programmatic consultation is no longer available for proposed restoration projects that are expected to result in additional take of that individual species. However, the programmatic consultation will remain available for proposed restoration projects that do not need coverage for that species where the take limit was reached.

Table 4: Self-Imposed Annual Take Limits.

Common Name	Self-Imposed Annual Take Limits
Amphibians	
arroyo toad	No more than 10 adults or juveniles injured or killed; 5% of larval captures killed or injured; 2 egg strands damaged or destroyed annually.
California red-legged frog	No more than 60 terrestrial adults or juveniles injured or killed outside of the Sierra Nevada (shared between Field Offices), 5 terrestrial adults or juveniles injured or killed for locations within the Sierra Nevada; and 5% of larval captures injured or killed annually.
California tiger salamander – Central California DPS	No more than 20 adults or juveniles injured or killed annually and no more than 10 per Field Office; No more than 5% of larval captures injured or killed annually.
California tiger salamander – Santa Barbara County DPS	No more than 5 adults or juveniles injured or killed annually and no more than 5% of larval captures killed or injured per pond annually.
foothill yellow-legged frog	No more than 20 adults or juveniles injured or killed annually and no more than 10 per Field Office. No more than 5% of larval captures injured or killed annually. Individual projects will be designed/implemented to not adversely affect a significant portion of the population in the project area.
mountain yellow-legged frog – northern California DPS	No more than 20 adults or juveniles injured or killed annually and no more than 10 per Field Office. No more than 5% of larval captures injured or killed annually. Individual projects will be designed/implemented to not adversely affect a significant portion of the population in the project area.
Santa Cruz long-toed salamander	No more than 5 adults or juveniles injured or killed annually. No more than 5% of larval captures killed or injured per pond annually.
Sierra Nevada yellow-legged frog	No more than 20 adults or juveniles injured or killed annually and no more than 10 per Field Office annually. No more than 5% of larval captures injured or killed annually. Individual projects will be designed/implemented to not adversely affect a significant portion of the population in the project area.
western spadefoot – Northern DPS	No more than 50 adults or juveniles injured or killed annually. No more than 5% of larval captures injured or killed per pond annually.
western spadefoot – Southern DPS	No more than 40 adults or juveniles injured or killed annually. No more than 5% of larval captures injured or killed per pond annually.
Yosemite toad	No more than 20 adults or juveniles injured or killed annually and no more than 10 per Field Office annually. No more than 5% of larval captures injured or killed annually. Individual projects will be designed/implemented to not adversely affect a significant portion of the population in the project area.

Common Name	Self-Imposed Annual Take Limits
Birds	
California least tern	No lethal take allowed. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of a tern colony. No net loss of habitat through implementation of protection measures and/or offsetting impacts with habitat restoration or enhancement.
California spotted owl – Coastal-Southern California DPS	No more than 1 pair harmed from disturbance annually.
California spotted owl – Sierra Nevada DPS	No more than 1 pair harmed from disturbance annually.
California Ridgway's rail	Injury or mortality of no more than 1 individual annually. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of the population in the project area. No net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.
coastal California gnatcatcher	Injury or mortality of no more than 1 nest annually. Mortality to a nest would include disturbance to an active nest with egg(s) or chick(s) in the nest or if fledglings are still dependent on the nest for survival. Harm to no more than 2 individuals annually. No net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.
least Bell's vireo	Injury or mortality of no more than 8 individuals and 4 nests annually. Mortality to a nest would include disturbance to an active nest with egg(s) or chick(s) in the nest or if fledglings are still dependent on the nest for survival. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of an occupied pairs' territory, except for restoration projects where the purpose is to remove non-native vegetation to improve least Bell's vireo habitat . No net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.
light-footed Ridgway's rail	Harm to no more than 5% of a given population annually. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of the population in the project area. No net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.
marbled murrelet	Injury or mortality to no more than 1 nesting murrelet pair and their dependent young (1 egg/chick per annual clutch) per recovery unit annually.
northern spotted owl	No more than 18 nesting individuals harmed from disturbance annually.
western snowy plover – Pacific Coast DPS	Death or injury of no more than 2 individuals annually per recovery unit. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of occupied plover habitat.

Common Name	Self-Imposed Annual Take Limits
Fish	
Delta smelt	No more than 1 individual injured or killed annually. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of the population in the project area. No net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.
Lahontan cutthroat trout	No more than 20 NTUs 500 feet downstream of the project site or no more than 20% above background conditions, whichever is greater. No more than 3% of capture and relocations injured or killed.
longfin smelt – San Francisco Bay-Delta DPS	No more than 40 individuals killed, injured, captured, or relocated annually.
tidewater goby	No more than 10% of all individuals captured and relocated may be injured or killed per project.
unarmored threespine stickleback	No more than 2 individuals injured or killed per local population annually.
Invertebrate	
California freshwater shrimp	No more than 3% of captured and relocated individuals injured or killed per project.
Conservancy fairy shrimp	No more than 10% temporary habitat loss per occupied pool. This limit can be exceeded for those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS FO, via the ESA Section 7(a)(2) Review Form Process.
longhorn fairy shrimp	No more than 10% temporary habitat loss per occupied pool. This limit can be exceeded for those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS FO, via the ESA Section 7(a)(2) Review Form Process.
Mount Hermon June beetle	No more than 20 individuals injured or killed annually.
Riverside fairy shrimp	No more than 10% temporary habitat loss per occupied pool. This limit can be exceeded for those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS FO, via the ESA Section 7(a)(2) Review Form Process.
San Diego fairy shrimp	No more than 10% temporary habitat loss per occupied pool. This limit can be exceeded for those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS FO, via the ESA Section 7(a)(2) Review Form Process.
Smith's blue butterfly	No more than 25 host plants lost annually.
valley elderberry longhorn beetle	No more than 50 shrubs lost annually.
vernal pool fairy shrimp	No more than 10% temporary habitat loss per occupied pool. This limit can be exceeded for those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS FO, via the ESA Section 7(a)(2) Review Form Process.

Common Name	Self-Imposed Annual Take Limits
vernal pool tadpole shrimp	No more than 10% temporary habitat loss per occupied pool. This limit can be exceeded for those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS FO, via the ESA Section 7(a)(2) Review Form Process.
Mammals	
riparian (San Joaquin Valley) woodrat	Injury or mortality of no more than 2 individuals annually. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of a population in the project area.
riparian brush rabbit	Injury or mortality of no more than 2 individuals annually. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of a population in the project area.
salt marsh harvest mouse	Injury or mortality of no more than 4 individuals and 1 nest equivalent annually. 1 nest equivalent is equal to all young within the nest or 4 total juveniles if a nest is not found. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of a population in the project area. No net loss of habitat through implementation of protection measures and/or offsetting impacts with habitat restoration or enhancement.
Reptiles	
Alameda whipsnake (striped racer)	Injury or mortality to no more than 4 adults or juveniles/hatchlings annually. No net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.
giant garter snake	Injury or mortality to no more than 4 adults or juveniles/hatchlings annually. No net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.
northwestern pond turtle	Injury or mortality to no more than 20 adults/juveniles and 30 hatchlings annually. No more than 2% of captures injured or killed per pond annually. No more than 25 acres of temporary nesting habitat lost and 2 acres of permanent nesting habitat lost annually.
San Francisco garter snake	Injury or mortality to no more than 4 adults or juveniles/hatchlings annually. No permanent loss of hibernacula.
southwestern pond turtle	Injury or mortality to no more than 10 adults/juveniles and 10 hatchlings annually. No more than 2% of captures injured or killed per pond annually. No more than 25 acres of temporary nesting habitat lost and 2 acres of permanent nesting habitat lost annually.

Note: Limits reset on January 1 each year. Limits apply to the entire range of the species (range-wide), unless otherwise indicated.

Protection Measures

The following GPMs will be incorporated, as applicable, into the project descriptions for individual projects authorized under the PBO. If a GPM does not apply at the project level, it will be indicated as such in the ESA Section 7(a)(2) Review Form. Not all GPMs may be appropriate or necessary to avoid and minimize impacts, depending on the scope, scale, and location of a project. Applicable measures should be determined by the Action Agency and the

Project Proponent in coordination with the respective USFWS Field Office/S7 Delegated Authority Program when completing the ESA Section 7(a)(2) Review Form.

Programmatic General Protection Measures

Project Proponents should consider the following applicable GPMs; however, only relevant GPMs apply. Not all GPMs may be appropriate or necessary to avoid and minimize impacts, depending on the scope, scale, and location of a project. As described in Section 2.1.2 *Administration of the PBO*, alternative measures to accommodate site-specific conditions or technological constraints or advances may be proposed by Project Proponents, subject to approval by the USFWS Field Office (further detail is provided in Section 2.1.2.3, Submittal Requirements). GPMs are presented first, followed by protection measures focused on water quality and vegetation/habitat, and then measures focused on Covered Species. The following GPMs will be incorporated, as applicable, into the project descriptions for individual proposed restoration projects covered by the PBO. If a GPM is not applicable at the project level, it will be indicated as such in the ESA Section 7(a)(2) Review Form.

GPM-1, Receipt and Copies of All Permits and Authorizations. Work will not begin until all necessary permits and authorizations have been issued (e.g., USACE, USFWS, NMFS, State and/or Regional Boards, or CDFW). The Project Proponent will ensure that a readily available copy of the applicable agency permits and authorizations (e.g., USFWS PBO, NMFS PBO, or Section 404 permit) is maintained by the construction foreperson/manager on the project site for the duration of project activities.

GPM-2, Construction Work Windows. Construction work windows may be required, depending on whether the project involves in-water construction and/or whether Covered Species have the potential to occur in the project area. Covered Species work windows are provided in Section 2.1.5.3, *Guild- and Species-Specific Protection* Measures.[1]

GPM-3, Construction Hours. Construction activities will generally be limited to daylight hours, to the extent practicable. If nighttime construction is necessary, including in tidally influenced waters where tides may limit daylight access and work schedules, all project lighting (e.g., staging areas, equipment storage sites, roadway, and construction footprint) will be selectively placed and directed onto the roadway or construction site and away from sensitive habitats. Light glare shields will be used to reduce the extent of illumination into sensitive habitats. If the work area is near surface waters, the lighting will be shielded so that it does not shine directly into the water.

GPM-4, Environmental Awareness Training. For projects occurring where Covered Species are likely to be present, prior to engaging existing or new personnel in construction activities, new construction personnel will participate in environmental awareness training conducted by a

[1] Extended or alternative work windows may be considered on an individual project basis with prior approval from USFWS ES, provided the Project Proponent can demonstrate that measures implemented to avoid or minimize exposure would do so at a level commensurate with the standard work windows.

Qualified Biologist. Construction personnel will be informed regarding the identification, potential presence, habitat requirements, legal protections, avoidance and minimization measures, and applicable protection measures for Covered Species with the potential to occur in or immediately adjacent to the project site. Construction personnel will be informed of the procedures to follow should a Covered Species be encountered during construction activities. For projects where the Qualified Biologist is not regularly on the project site, training may be provided in an online/virtual meeting. For projects that may continue over an extended duration and require excessive training events, a training video developed under the supervision of the Qualified Biologist may be used to train new personnel, as long as a Qualified Biologist is available by phone to answer questions about the training or to answer questions that may arise during construction.

GPM-5, Environmental Monitoring. Where appropriate and based on project-specific requirements, a Qualified Biologist(s) will perform site clearance at the beginning of each day and will monitor construction activities throughout the day in, or immediately adjacent to, sensitive resources and/or Covered Species habitat (including critical habitat as applicable), as necessary. The Qualified Biologist will confirm that all applicable protection measures are implemented during project construction. The Qualified Biologist will have the authority to stop any work if they determine that any permit requirement is not fully implemented or if it is necessary to protect Covered Species, consistent with the information provided in a signed ESA Section 7(a)(2) Review Form by the USFWS Field Office to cover the proposed project by the PBO. The Qualified Biologist will prepare and maintain a biological monitoring log of construction site conditions and observations, which will be kept on file.

GPM-6, Work Area and Speed Limits. Construction work and materials staging will be restricted to the smallest area practicable in designated work areas, routes, staging areas, temporary interior roads, or the limits of existing roadways. Prior to initiating construction or grading activities, brightly colored fencing or flagging or other practical means will be erected to demarcate the limits of the project activities, including the boundaries of designated staging areas; ingress and egress corridors; stockpile areas for spoils disposal, soil, and materials; and equipment exclusion zones. Flagging or fencing will be maintained in good repair for the duration of project activities. Posted speed limits on public roadways will be adhered to and speeds will be limited to 20 miles per hour (mph) in the project area on unpaved surfaces and unpaved roads (to reduce dust and soil erosion), or in areas where Covered Species have the potential to occur. Speeds greater than 20 mph may be permitted in the project area where Covered Species are not expected to occur (e.g., in areas where Covered Species have been excluded) and there is no risk of generating excessive dust (e.g., surfaces are paved, saturated, or have been treated with other measures to prevent dust). Additional details are provided in Section 2.1.5.3, *Guild- and Species-Specific Protection* Measures, where applicable. See also IWW-4, *In-Water Staging Areas and Use of Barges*.

GPM-7, Environmentally Sensitive Areas and/or Wildlife Exclusion. Where appropriate, fencing, flagging, or biological monitoring will be used to minimize disturbance to environmentally sensitive areas and Covered Species habitat. If the project site is suitable for

fencing, prior to the start of construction, environmentally sensitive area fencing (ESAF) and/or Wildlife Exclusion Fencing (WEF) will be installed between the active work area(s) and any suitable terrestrial habitat where Covered Species could enter the site. When fencing is not practicable due to project size, topography, soils, or other factors, monitoring by a Qualified Biologist during construction activities can be used to minimize impacts (see GPM-5, *Environmental Monitoring*).

- The Qualified Biologist will determine the location of the ESAF and/or WEF prior to the start of construction.
- WEF specifications (e.g., height, installation requirement, or materials) will be determined based on the species the fencing is intended to exclude. ESAF does not require such specifications and may include flagging or monitoring (see GPM-5, Environmental Monitoring).
- The ESAF and/or WEF will remain in place throughout the duration of the construction activities and will be inspected and maintained regularly by the Qualified Biologist until completion of the project. Repairs to the ESAF and/or WEF will be made within 24 hours of discovery. The fencing will be removed only when all construction equipment is removed from the site, the area is cleared of debris and trash, and the area is returned to natural conditions.

GPM-8, Prevent Spread of Invasive Species. The spread or introduction of nonnative, invasive plant and animal species will be avoided. When practicable, nonnative invasive plants in the project areas will be removed and properly disposed of in a manner that will not promote their spread. Equipment will be cleaned of any sediment or vegetation at designated wash stations before entering or leaving the project area, to avoid spreading pathogens or nonnative invasive species. Activities that create new habitat for nonnative invasive species will be avoided. Isolated infestations of nonnative invasive species identified in the project area will be treated with weed management methods at an appropriate time, to prevent further formation of seed and destroy viable plant parts and seed. Wash sites must be in confined areas that limit runoff to any surrounding habitat, and on a flat grade. Upland areas will use rice straw or invasive species-free local slash/mulch for erosion control; the remainder of the project area will use certified, weed-free erosion control materials. Mulch must be certified weed-free. The Project Proponent will follow the guidelines in the CDFW's California Aquatic Invasive Species Management Plan (CDFW 2008) and Aquatic Invasive Species Disinfection/Decontamination Protocols (CDFW 2016). Construction supervisors and managers will be educated on weed identification and the importance of controlling and preventing the spread of invasive weeds.

GPM-9, Practices to Prevent Pathogen Contamination. The Project Proponent will review and implement restoration design considerations and best management practices (BMPs) to help prevent pathogen contamination, as published by the "Working Group for *Phytophthoras* in Native Habitats" (www.calphytos.org), when there is a risk of introduction and spread of plant pathogens in site plantings. The Project Proponent will review and implement decontamination protocols to prevent the spread of pathogens among amphibians or other aquatic animals when working in aquatic habitats that may support native amphibians. Gear and equipment that may

contact water will be cleaned and decontaminated to prevent the spread of chytrid fungus, following protocols in Aquatic Invasive Species Disinfection/Decontamination Protocols (CDFW 2016, or latest version). For additional guidance related to amphibians and chytrid fungus, see AMP-4 and AMP-10.

GPM-10, Equipment Maintenance and Materials Storage. Vehicle traffic will be confined to existing roads and the proposed access route(s). All machinery must be in good working condition, showing no signs of fuel or oil leaks. Oil, grease, or other fluids will be washed off at designated wash stations prior to entering the construction site. Inspection and evaluation for the potential for fluid leakage will be performed daily during construction. All fuel and chemical storage, servicing, and refueling will be done in an upland staging area or other suitable location (e.g., barges) with secondary containment to prevent spills from traveling to surface water or drains. Project Proponents will establish staging areas for equipment storage and maintenance, construction materials, fuels, lubricants, solvents, and other possible contaminants in coordination with resource agencies. Staging areas will have a stabilized entrance and exit and will be at least 100 feet from waterbodies, unless site-specific circumstances do not provide such a setback; in such cases, the maximum setback possible will be used. Fluids will be stored in appropriate containers with covers and will be properly recycled or disposed of off-site. Machinery stored on site will have pans or absorbent mats placed underneath potential leak areas.

GPM-11, Material Disposal. All refuse, debris, unused materials, and supplies that cannot reasonably be secured will be removed daily from the project work area and deposited at an appropriate disposal or storage site. All construction debris will be removed from the work area immediately on project completion. The Water Quality and Hazardous Materials (Section 2.1.5.2, *Water Quality and Hazardous Materials*) measures will be implemented to ensure proper handling and disposal of hazardous materials.

GPM-12, Fugitive Dust Reduction. To reduce dust, construction vehicles will be speed-restricted as described in GPM-6, *Work Area and Speed Limits*, when traveling on nonpaved surfaces. Stockpiled materials susceptible to wind-blown dispersal will be covered with plastic sheeting or other suitable material to prevent movement of the material. During construction, water (e.g., trucks, and portable pumps with hoses) or other approved methods will be used to control fugitive dust. Dust suppression activities must not result in a discharge to waterbodies.

GPM-13, Trash Removed Daily. During project activities all trash, especially food-related refuse that may attract potential predators or scavengers, will be properly contained in sealed containers, removed from the work site, and disposed of daily.

GPM14, Project Cleanup after Completion. Work pads, temporary falsework, and other construction items will be removed from the 100-year floodplain by the end of the construction window. Removal of materials must not result in discharge to waterbodies.

GPM-15, Revegetate Disturbed Areas. All temporarily disturbed areas will be decompacted and seeded/planted with an assemblage of native riparian, wetland, and/or upland plant species suitable for the area. The Project Proponent will develop a revegetation plan. Plants for

revegetation will come primarily from active seeding and planting, or from natural recruitment where applicable. Plants imported to the restoration areas will come from local stock. Only native plants (genera) will be used for restoration efforts. Certified weed-free native mixes and mulch will be used for any restoration planting or seeding. Revegetation activities in and adjacent to waterbodies and other aquatic habitat suitable for Covered Species will commence after construction activities at a site are complete.

GPM-16, Wildfire Prevention. With the exception of vegetation-clearing equipment, no vehicles or construction equipment will be operated in areas of tall, dry vegetation. A fire prevention and suppression plan will be developed and implemented for all maintenance and repair activities that require welding or otherwise have a risk of starting a wildfire.

Water Quality and Hazardous Materials

The following protection measures for water quality and hazardous materials should be considered for projects that meet the activity criteria identified in each measure, and appropriate protection measures should be proposed as part of the ESA Section 7(a)(2) Review Form. The following sections include protection measures to address staging and stockpiling materials, erosion and sedimentation, potentially hazardous materials, in-water work, dewatering and species relocation, pile driving and pile replacement, and dredging operations (including dredging material reuse).

Staging and Stockpiling of Materials

WQHM-1, Staging Areas and Stockpiling of Materials and Equipment. Staging, storage, and stockpile areas must be outside of habitat suitable for Covered Species unless necessary for project implementation and approved by the Action Agency and the USFWS Field Office. Where feasible, staging will occur on access roads or other previously disturbed upland areas, such as developed areas, paved areas, parking lots, areas with bare ground or gravel, and areas clear of vegetation, to avoid sensitive habitats and limit disturbance to surrounding habitats. Similarly, all maintenance equipment and materials (e.g., road rock and project spoil) will be restricted to the existing service roads, paved roads, or other determined designated staging areas. See GPM-10, *Equipment Maintenance and Materials Storage*, for more details regarding protection measures for materials storage.

Staging areas will be established for equipment storage and maintenance, construction materials, fuels, lubricants, solvents, and other possible contaminants. Staging areas will have a stabilized entrance and exit and will be at least 100 feet from bodies of water, unless site-specific circumstances do not provide such a setback; in such cases, the maximum setback possible will be used. See also IWW-2, *In-Water Vehicle Selection and Work Access*; and IWW-4, *In-Water Staging Areas and Use of Barges.* If an off-road staging area is chosen and if Covered Species are potentially present, the Qualified Biologist will survey the selected site to verify that no sensitive resources would be disturbed by staging activities.

Stockpiling of materials, portable equipment, vehicles, and supplies (e.g., chemicals), will be restricted to the designated construction staging areas. If rain is predicted in the forecast during

the dry season, and stockpiled soils will remain exposed and unworked for more than 7 days, then erosion and sediment control measures must be used. If there is a high-wind scenario, then soils will be covered at all times. During the wet season, no stockpiled soils will remain exposed, unless properly installed and maintained erosion controls are in place on and around the stockpile. Temporary stockpiling of material onsite will be minimized. Stockpiled material will be placed in upland areas far enough away from Covered Species habitat that these materials cannot discharge to waters of the United States. Additional species-specific erosion control measures may also be necessary because of the potential for listed species at the project site. More detail is provided in Section 2.1.5.3, *Guild and Species-Specific Protection Measures*.

Erosion and Sedimentation Control Measures

WQHM-2, Storm Water Pollution Prevention Plan. All projects that are required to obtain coverage under the NPDES General Order for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Order) will prepare and implement a site-specific storm water pollution prevention plan (SWPPP), as required by the Construction General Order.

WQHM-3, Erosion Control Plans. For projects that do not require coverage under an NPDES permit per WQHM-2, the Project Proponent will include appropriate BMPs, and a rain even action plan if seasonal rain during the construction period might occur, to reduce the potential release of water quality pollutants to receiving waters. BMPs may include the following measures:

Install erosion control measures, such as straw bales, silt fences, fiber rolls, or equally effective measures, at riparian areas adjacent to stream channels, drainage canals, and wetlands, as needed. Erosion control measures will be monitored during and after each storm event for effectiveness. Modifications, repairs, and improvements to erosion control measures will be made as needed to protect water quality.

Erosion control products that include synthetic or plastic monofilament or cross-joints in the netting that are bound/stitched (e.g., straw wattles, fiber rolls, or erosion control blankets) and could trap snakes, amphibians, and other wildlife will not be used.

Other Water Quality Measures

WQHM-4, Hazardous Materials Management and Spill Response. As part of the SWPPP or Erosion Control Plan (see WQHM-2 and WQHM-3), the Project Proponent will prepare and implement a hazardous materials management and spill response plan. The Project Proponent will ensure that any hazardous materials are stored at the staging area(s) with an impermeable membrane between the ground and hazardous material, and that the staging area is designed to prevent the discharge of pollutants to groundwater and runoff water. The Project Proponent will use and store hazardous materials, such as vehicle fuels and lubricants, in designated staging areas away from stream channels and wetlands, unless otherwise approved in the ESA Section 7(a)(2) Review Form, according to local, state, and federal regulations. The Project Proponent will notify regulatory agencies within 24 hours of any leaks or spills and will properly

contain and dispose of any unused or leftover hazardous products off site. Also see GPM-10, *Equipment Maintenance and Materials Storage*, for more detail on spill prevention.

WQHM5, In-Water Concrete Use. Poured concrete will be excluded from contact with surface or groundwater during initial curing, ideally for 30 days after it is poured. During that time, runoff from the concrete will not be allowed to enter surface or groundwater. If this is not feasible due to expected flows and site conditions, commercial sealants that are appropriate for use near water may be applied before the sealant comes into contact with flowing water. If sealant is used, water will be excluded from the site until the sealant is dry and fully cured, according to the manufacturer's specifications. Concrete is considered to be cured when water poured over the surface of concrete consistently has a pH of less than 8.5. More information regarding excluding water from a site is provided in Section 2.1.5.2.2, *Dewatering Activities and Aquatic Species Relocation*.

General In-Water Measures

IWW-1, Appropriate In-Water Materials. Selection and use of gravels, cobble, boulders, and instream woody materials in streams, and other materials (e.g., oyster shells, other substrates) for reef/bed restoration will be performed to avoid and/or minimize adverse impacts to aquatic Covered Species and their habitats. On-site gravels will be screened and sorted; Gravels imported from a commercial source will be clean-washed and of appropriate size. As necessary to protect Covered Species, placement will be overseen by a Qualified Biologist; implementation timing will be determined based on the least amount of overlap (or impact on) all sensitive biological resources that may be affected, and the timing of their use of the receiving area. Imported gravel from outside the project watershed will not be from a source known to contain historical hydraulic gold mine tailings, dredger tailings, or mercury mine waste or tailings, unless the gravel is tested for mercury and other toxins. The gravel must meet low concentration thresholds and fall within acceptable limits approved by the USFWS. Materials that may foul or degrade spawning gravels (e.g., sand or soil eroding from sandbag or earthen dams) will be managed to avoid release and exposure in salmonid streams. Oyster shells or other substrates for reef/bed restoration will be cured and inspected to be free of pathogens and/or nonnative species.

IWW-2, In-Water Vehicle Selection and Work Access. If work requires that equipment enter wetlands or below the banks of a Water of the US, equipment with low ground pressure will be used to minimize soil compaction. Low-ground-pressure heavy equipment mats will be used, if needed to lessen soil compaction. Hydraulic fluids in mechanical equipment working in the waters of the United States or any other aquatic habitat suitable for Covered Species will not contain organophosphate esters. The amount of time this equipment is stationed, working, or traveling in the waters of the United States or other aquatic habitat suitable for Covered Species will be minimized. All equipment will be removed from the aquatic feature during nonwork hours or returned to the staging area approved through the ESA Section 7(a)(2) Review Form process in the aquatic feature.

IWW-3, In-Water Placement of Materials, Structures, and Operation of Equipment. Material used for bank stabilization or in-water restoration will minimize discharge sediment or

other forms of waste to waters of the United States or other aquatic habitat suitable for Covered Species. Construction will occur from the top of the stream bank, on a ground protection mat underlain with filter fabric, or a barge. All materials placed in streams, rivers, or other waters will be nontoxic. Any combination of wood, plastic, cured concrete, steel pilings, or other materials used for in-channel structures will not contain coatings or treatments, or consist of substances toxic to aquatic organisms (e.g., zinc, arsenic, creosote, copper, other metals, pesticides, or petroleum-based products) that may leach into the surrounding environment in amounts harmful to aquatic organisms. Except for the following conditions, equipment must not be operated in standing or flowing waters without site-specific approval from the USFWS Field Office:

- All construction activities must be effectively isolated from water flows, to minimize the potential for runoff. This may be accomplished by working in the dry season or dewatering the work area in the wet season.
- When work in standing or flowing water is required, structures for isolating the in-water work area and/or diverting the water flow must not be removed until all disturbed areas are cleaned and stabilized. The diverted water flow must not be contaminated by construction activities.
- All open-flow temporary diversion channels must be lined with filter fabric or other appropriate liner material to prevent erosion. Structures used to isolate the in-water work area and/or divert the water flow (e.g., cofferdam or geotextile silt curtain) must not be removed until all disturbed areas are stabilized.

IWW-4, In-Water Staging Areas and Use of Barges. Where appropriate and practical, barges will be used to stage equipment and construct the project, to reduce noise, traffic disturbances, and effects on terrestrial vegetation. When barge use is not practical, construction equipment and plant materials will be staged in staging areas approved through the ESA Section 7(a)(2) Review Form process. Existing staging sites, maintenance toe roads, and crown roads will be used for project staging and access to avoid affecting previously undisturbed areas. For projects that involve in-water work for which boats and/or temporary floating work platforms are necessary, buoys will be installed so that moored vessels will not beach on the shoreline and anchor lines will not drag. Moored vessels and buoys will not be within 25 feet of vegetated shallow waters.

Dewatering Activities and Aquatic Species Relocation

This section includes GPMs for dewatering activities and species relocation. Measure IWW-5 provides the framework for a capture and relocation plan in general terms. Details on specific aquatic species rescue and relocation are described in the specific Species Protection Measures.

IWW-5, Cofferdam Construction. Cofferdams may be installed both upstream and downstream, and along portions of the cross section of a channel or other waterway, if necessary to isolate the extent of the work areas. Construction of cofferdams will begin in the upstream area and continue in a downstream direction, enabling water to drain and allowing fish and aquatic wildlife species to leave (under their own volition) the area being isolated by the cofferdam, prior to closure. The flow will then be diverted only when construction of the

upstream dam (if necessary) is completed and the work area has been naturally drained of flow; at this point, the downstream dam (if necessary) would be completed, and flow would be diverted around the work area. Cofferdams and stream diversion systems will remain in place and fully functional throughout the construction period. To minimize adverse effects to Covered Species, stream diversions will be limited to the shortest duration necessary to complete in-water work. In-water cofferdams will only be built from materials such as sandbags, clean gravel, rubber bladders, vinyl, steel, or earthen fill, and will be built in a manner that minimizes siltation and/or turbidity. Cofferdams will be pushed into place. If pile driving (sheet piles) is required, vibratory hammers will be used, and impact hammers will be avoided. If necessary, the footing of the cofferdam will be keyed into the channel bed at an appropriate depth to capture the majority of subsurface flow needed to dewater the streambed. When cofferdams with bypass pipes are installed, debris racks will be placed at the bypass pipe inlet in a manner that minimizes the potential for fish impingement and/or entrapment. Bypass pipes will be monitored for accumulation of debris, and accumulated debris will be removed. When appropriate, cofferdams will be removed so that surface elevations of water impounded above the cofferdam will not be reduced at a rate greater than 1 inch per hour. Cofferdams in tidal waters will be removed during the lowest possible tide and in slack water to minimize disturbance and turbidity. This will minimize the probability of fish and other aquatic species stranding as the area upstream becomes dewatered. All dewatering/diversion facilities will be installed so that natural flow is maintained upstream and downstream of project areas. An area may need to be dewatered long enough to allow Covered Species to leave on their own before final clearance surveys and construction can begin.

IWW6, Dewatering/Diversion. The area to be dewatered will encompass the minimum area necessary to perform construction activities. The Project Proponent will provide a dewatering plan with a description of the proposed dewatering structures and appropriate BMPs for the installation, operation, maintenance, and removal of those structures. The period of dewatering/diversion will extend only for the minimum amount of time needed to perform the restoration activity and to allow Covered Species time to leave on their own before final clearance surveys and construction can begin. Dewatering/diversion will occur via gravity-driven systems, where feasible and except as specified below. Dewatering/diversion will be designed to avoid direct and preventable indirect mortality of fish and other aquatic species. If Covered Fish Species may be present in the area to be dewatered, a fish capture and relocation plan will be developed and implemented for review and approval by the appropriate agencies. Stream flows will be allowed to gravity flow around or through the work site, using temporary bypass pipes or culverts. Bypass pipes will be sized to accommodate a minimum of twice the expected construction-period flow and not increase stream velocity and will be placed at stream grade. Conveyance pipe outlet energy dissipaters will be installed to prevent scour and turbidity at the discharge location.

When gravity-fed dewatering is not feasible and pumping is necessary to dewater a work site, a temporary siltation basin and/or silt bags may be required to prevent sediment from reentering the wetted channel. Silt fences or mechanisms to avoid sediment input to the flowing channel will be installed adjacent to flowing water. Water pumped or removed from dewatered areas will

be conducted in a manner that does not contribute turbidity to nearby receiving waters. Pumps will be refueled in an area well away from the stream channel. Fuel-absorbent mats will be placed under the pumps while refueling. Equipment working in the stream channel or within 25 feet of a wetted channel will have a double (i.e., primary and secondary) containment system for diesel and oil fluids.

All work will comply with the CDFW Fish Screening Criteria (CDFW 2001) or NMFS Fish Screening Criteria for Anadromous Salmonids (NOAA 2022). Pump intakes will be covered with mesh, in accordance with the requirements of current fish screening criteria, to prevent potential entrainment of fish or other aquatic species that could not be removed from the area to be dewatered. The pump intake will be checked periodically for impingement of fish or other aquatic species. Diverted flows must be of sufficient quality and quantity, and of appropriate temperature, to support existing fish and other aquatic life both above and below the diversion. Pre-project flows must be restored to the affected surface waterbody on completion of work at that location. Where diversions are planned, contingency plans will be developed that include oversight for breakdowns, fueling, maintenance, leaks, etc.

IWW-7, Fish and Aquatic Species Exclusion While Installing Diversion Structures. Fish and other aquatic species will be excluded from occupying the area to be dewatered by blocking the stream channel above and below with fine-meshed block nets or screens, based on the site conditions, while cofferdams and other diversion structures are being installed. Block net mesh will be sized to ensure that aquatic species upstream or downstream do not enter the areas proposed for dewatering. Mesh will be no greater than 1/8-inch diameter. The bottom of the net must be completely secured to the channel bed. Block nets or screens must be checked at least twice daily at the beginning and end of the workday and cleaned of debris to permit free flow of water. Block nets or screens will be placed and maintained throughout the dewatering period at the upper and lower extent of the areas where aquatic species will be removed. Net placement is temporary and will be removed once dewatering has been accomplished, or construction work is complete for the day.

Pump intakes will be covered with mesh, in accordance with the requirements of current NMFS fish screening criteria, to prevent potential entrainment of fish or other aquatic species that could not be removed from the area to be dewatered. The pump intake will be checked periodically for impingement of fish or other aquatic species. All work will comply with the CDFW Fish Screening Criteria (CDFW 2001) or NMFS Fish Screening Criteria for Anadromous Salmonids (NOAA 2022).

IWW-8, Removal of Diversion and Barriers to Flow. On completion of construction activities, any diversions or barriers to flow will be removed in a manner that will allow flow to resume with the least disturbance to the substrate. Alteration of creek beds will be minimized; any imported material that is not part of the project design will be removed from stream beds on completion of the project.

In-Water Pile Driving and Pile Replacement

IWW-9, In-Water Pile Driving Plan for Sound Exposure. Project Proponents will develop a plan for pile-driving activities to minimize impacts to Covered Species and submit it for USFWS Field Office review and approval as part of the ESA Section 7(a)(2) Review Form review process (Section 2.1.2, *Administration of the PBO*). Measures will be implemented to minimize underwater sound pressure to levels below fish thresholds for peak pressure and accumulated sound exposure levels. Threshold levels established in *Fisheries Acoustic Work Group's Agreement in Principle for Interim Criteria for Injury to Fish from Pile Driving Activities* (FHWG 2008) can be used as a guideline for the protection of Covered Species. The plan will describe the method that is least impactful to aquatic organisms, and will identify the number, type, and size of piles; estimated sound levels caused by the driving; number of piles driven each day; qualifications of monitors; any other relevant details on the nature of the pile-driving activity; and the actions that will be taken to ensure that a project stays within the required sound exposure thresholds.

IWW-10, In-Water Pile Driving Methods. Pile driving will occur during approved work windows, with reduced currents, and only during daylight hours. Pile driving will be conducted with vibratory or low/nonimpact methods (i.e., hydraulic) that result in sound pressures below threshold levels. Applied energy and frequency will be gradually increased until necessary full force and frequency are achieved. If it is determined that impact hammers are required and/or underwater sound monitoring demonstrates that thresholds are being exceeded, the contractor will implement sound dampening or attenuation devices to minimize sound levels; these may include:

- A cushioning block used between the hammer and pile
- A confined or unconfined air bubble curtain
- If site conditions allow, pile driving in the dry area (dewatered) behind the cofferdam

Pile driving will follow the criteria outlined in the most recent version of the California Department of Transportation's *Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish* (Caltrans 2015).

IWW-11, Sediment Containment During In-Water Pile Driving. A continuous length of silt curtain, fully surrounding the pile-driving area and installed close to piers, will be used to protect aquatic resources and provide sediment containment while construction activities are occurring if working in a wetted channel. The silt curtain will prevent the release of a turbidity plume and trap sediment that may become suspended as a result of the pile driving. The bottom of the silt curtains must be weighted (e.g., with ballast weights or rods affixed to the base of the fabric) to resist the natural buoyancy of the silt curtain fabric and lessen its tendency to move in response to currents. Floating silt curtains will be anchored and deployed from the surface of the water to just above the substrate. The silt curtain will be monitored for damage, dislocation, or gaps and will be immediately repaired where it is no longer continuous or where it has loosened. The silt curtain must restrict the surface visible turbidity plume to the area of pile construction and must control and contain the migration of resuspended sediments at the water surface and at depth.

These IWW-11 measures may be waived or modified by the USFWS Field Office when pile driving involves only non-self-propelled, hand-driven methods (e.g., using a hand-held manual or pneumatic pounder) and commensurate small diameter pile material (e.g., nontreated tree stakes less than 5 inches in diameter).

IWW-12, Pile-Driving Monitoring. A Qualified Biologist will be on site during pile-driving activities to minimize effects to Covered Species. If any stranding, injury, or mortality to Covered Species is observed, the USFWS Field Office will be notified in writing (e.g., via email) within 24 hours and in-water pile driving will cease until the USFWS Field Office provides guidance on how to proceed.

Dredging Operations and Dredge Materials Reuse

IWW-13, Dredging Operations and Dredging Materials Reuse Plan. The Project Proponent will develop and implement a dredging operations and dredging materials management plan to minimize the effects that could occur during dredging operations and material reuse and disposal. If material is being imported from off site or if there are specific concerns about residual contaminants in the soil from historical land use activities (which can be determined on a site-specific basis), the plan will describe a sampling program for conducting physical and chemical analyses of sediments before import and/or disturbance. It will also describe BMPs to be implemented during dredging operations (e.g., using less intrusive dredging procedures, properly containing dredging spoils and water, using silt curtains, using methods to minimize turbidity, and timing dredging activity to coincide with low flows). The plan will also describe methods to evaluate the suitability of dredged material for reuse and disposal.

Vegetation/Habitat Disturbance

The following protection measures for vegetation disturbance should be considered for projects that meet activity criteria identified in each measure.

VHDR-1, Avoidance of Vegetation Disturbance. The Project Proponent will minimize the amount of soil, terrestrial vegetation, emergent vegetation, and submerged vegetation (e.g., eelgrass and kelp in marine areas, or submerged aquatic vegetation in freshwater areas) disturbed during project construction and completion by using methods creating the least disturbance to vegetation. Disturbance to existing grades and native vegetation, the number of access routes, the size of staging areas, and the total area disturbed by the project will be limited to the extent of all temporary and permanent impacts, as defined by the final project design. All roads, staging areas, and other facilities will be placed to avoid and limit disturbance to aquatic habitat suitable for Covered Species (e.g., streambank or stream channel, and riparian habitat). Existing ingress or egress points will be used and/or work will be performed either from the top of the banks, from barges on the waterside of the stream or levee bank, or from dry gravel beds. Existing native vegetation will be retained as practicable, emphasizing the retention of shade-producing and bank-stabilizing trees and brush with greater than 6-inch-diameter branches or trunks. Vegetation disturbance and soil compaction will be minimized by using low-ground-pressure

equipment that has a greater reach than or exerts less pressure per square inch on the ground than other equipment.

VHDR-2, Native and Invasive Vegetation Removal Materials and Methods. All invasive plant species (e.g., those rated as invasive by the Cal-IPC, or local problem species) will be removed from the project site as practicable, using locally and routinely accepted management practices. Invasive plant material will be destroyed using approved protocols and disposed of at an appropriate upland disposal or compost area. Invasive plant materials stockpiled at sites known to experience flash flooding outside the flood season will be removed within 15 days of the initial creation of the stockpile, to contain the potential spread of invasive plant material. Stockpiling of invasive plant materials is prohibited during the flood season (typically November to April).

Nonnative Plant Removal

1. When practicable, nonnative plants will be removed when flowers or seeds are not present. If flowers or seeds are present and have the potential for seed to be widely dispersed during removal (e.g., Spanish broom [*Spartium junceum*] and eupatory [*Ageratina adenophora*]), the flowering head will be removed and placed in a container for disposal prior to removal.
2. Whenever practicable, nontarget vegetation will be protected in order to minimize the creation of exposed ground and potential for re-colonization of nonnative plants. A botanist will be consulted prior to any restoration implementation and during preparation of restoration plans.
3. Where appropriate, barriers will be installed to limit illegal off-highway vehicle activity following removal of nonnative vegetation along roadways. Examples of barriers are large rocks, soil berms, and cut vegetation.

   To the extent practicable, crews in known or assumed[2] occupied habitat for Covered Species will minimize multiple stream crossings for nonnative plant removal from both streambanks simultaneously (e.g., during a work period, an individual will conduct activities along one streambank for the entire stretch before initiating activities on the opposing bank). Stream crossings will use existing features such as bridges and boulders to avoid boots in the water, as much as feasible.

VHDR-3, Revegetation Materials and Methods. On completion of work, site contours will be returned to preconstruction conditions or designed to provide increased biological and hydrological functions. Where disturbed, topsoil will be conserved for reuse during restoration, to the extent practicable. Native plant species comprising a diverse community structure (plantings of both woody and herbaceous species, if both are present) that follow a plant species palette approved through the ESA Section 7(a)(2) Review Form process will be used for

[2] Habitat will be assumed occupied when suitable habitat is present within the current range of the species and their absence has not been determined by a negative finding using protocol level surveys.

revegetation of disturbed and compacted areas, as appropriate. See also GPM-15: Revegetate Disturbed Areas, which also allows for revegetation through natural recruitment (e.g., in tidal and managed wetlands and working landscapes where disturbed areas typically revegetate more quickly through natural recruitment than through seeding).

Any area barren of vegetation as a result of project implementation will be restored to a natural state by mulching, seeding, planting, or other means, with native trees, shrubs, willow stakes, erosion control native grass seed mixes, or herbaceous plant species, following completion of project construction. Restoration planning for these areas should include steps to prevent colonization by nonnative species, including recolonization by any nonnative plant species that occupied the site prior to project implementation. Irrigation may also be required to ensure survival of containerized shrubs or trees or other vegetation, depending on rainfall. If irrigation is used, all irrigation materials will be removed once no longer needed. Soils that have been compacted by heavy equipment will be decompacted by shallow or deep ripping, if necessary to allow for revegetation at project completion as heavy equipment exits the construction area.

VHDR4, Revegetation Erosion Control Materials and Methods. If erosion control fabrics are used in revegetated areas, they will be slit in appropriate locations to allow for plant root growth. Only non-monofilament, wildlife-safe fabrics will be used. All exclusion netting/caging placed around plantings will be removed after 2 years or sooner.

VHDR-5, Revegetation Monitoring and Reporting. All revegetated areas will be maintained and monitored for a minimum of 2 years after replanting is complete, or until success criteria are met, to ensure that the revegetation effort is successful. The standard for success is 60% cover compared to pre-project conditions at the project site or at least 60% cover compared to an intact, local reference site. If an appropriate reference site or pre-project conditions cannot be identified, success criteria will be developed for review and approval on a project-by-project basis, based on the specific habitat impacted and known recovery times for that habitat and geography. The Project Proponent will prepare a summary report of the monitoring results and recommendations on December 1 each year. The report will be provided to the respective USFWS Field Office (copy the Lead Action Agency).

Herbicide Use

The following protection measures may be relevant to projects where herbicide application is anticipated as a project activity.

VHDR-6, General Herbicide Use. Chemical control of invasive plants and animals will only be used when other methods are determined to be ineffective or would create greater environmental impacts than chemical control**.** Herbicide use will be evaluated on a project-by-project basis, with consideration of (and preference given toward) IPM strategies wherever possible. See University of California statewide IPM Program for guidance documents (http://ipm.ucanr.edu/index.html). Broadcast spraying, including the use of aerial drones, may be used if it provides greater application accuracy and access. Any chemical considered for control of invasive species must be approved for use in California; its application must adhere to all

regulations, in accordance with the California Environmental Protection Agency (CEPA 2011 or most recent version); and it must be applied by a licensed applicator under all necessary state and local permits. Herbicides will be used only in a context where all treatments are considered, and various methods are used individually or in concert to maximize the benefits while reducing undesirable effects and applying the lowest legal effective application rate, unless site-specific analysis determines that a lower rate is needed to reduce nontarget impacts. Only the minimum area necessary for effective control will be treated. Whenever feasible, reduce vegetation biomass by mowing, cutting, or grubbing it before applying herbicide to reduce the amount of herbicide needed. Within 25 feet of any Water of the US, only formulations approved by the United States Environmental Protection Agency for aquatic use will be used. Soil-activated herbicides can be applied as long as directions on the label are followed.

To limit the opportunity for surface water contamination with herbicide use, all projects will have a minimum buffer for ground-based broadcast application of 100 feet, and the minimum buffer with a backpack sprayer is 15 feet (aerial application is not included in the Proposed Action).

The licensed Applicator will follow recommendations for all California restrictions, including wind speed, rainfall, temperature inversion, and ground moisture for each herbicide used. In addition, herbicides will not be applied when rain is forecast to occur within 24 hours, or during a rain event or other adverse weather conditions (e.g., snow, fog).

Herbicide adjuvants are limited to water or nontoxic or practically nontoxic vegetable oils and agriculturally registered, food grade colorants (e.g., Dynamark U.V. [red or blue], Aquamark blue, or Hi-Light blue) to be used to detect drift or other unintended exposure to waterways.

Any herbicides will be transported to and from the worksite in tightly sealed waterproof carrying containers. The licensed Applicator will carry a spill cleanup kit. Should a spill occur, people will be kept away from affected areas until clean-up is complete. Herbicides will be mixed more than 150 feet, as practicable, from any water of the state to minimize the risk of an accidental discharge. Impervious material will be placed beneath mixing areas in such a manner as to contain any spills associated with mixing/refilling.

VHDR-7, Herbicide Application Planning. Written chemical application, monitoring, and reporting prescriptions will be provided to each Project Proponent from a certified Pest Control Advisor (PCA) (CEPA 2011). The PCA will ensure that legal, appropriate, and effective chemicals are used, with appropriate methodologies. Field scouting must be done before application; the licensed Applicator (CEPA 2011) must be on site to lead all applications and will adhere to the PCA prescription and standard protection measures for application. Prior to field scouting or application, the PCA should receive Environmental Awareness Training (see GPM-4, Environmental Awareness Training) for the project so that they are aware of Covered Species and habitats present at the project site. The PCA monitoring prescription should address timing necessary to evaluate and report target species efficacy as well as any nontarget plant and animal effects. As applicable, Best Management Practices for Wildland Stewardship: Protecting Wildlife When Using Herbicides for Invasive Plant Management (Cal-IPC 2015 or the most

recent version) will be followed. If the guidance cannot be followed as applicable, then a project specific IPM Plan will also be submitted with the ESA Section 7(a)(2) Review Form.

VHDR-8, Herbicide Application Reporting. The licensed applicator will keep a record of all plants/areas treated; amounts and types of herbicides used; and dates of application as well as other monitoring elements prescribed by the PCA in VHDR-7; pesticide application reports must be completed within 24 hours of application and submitted to the applicable agencies for review. Wind and other weather data will be monitored and reported for all application reports.

Below is a description of the known toxicity of herbicides proposed for use under this programmatic. If other herbicides are proposed for use by a Project Proponent, a complete effects analysis must be submitted along with the ESA Section 7(a)(2) Review Form to allow USFWS to determine if application of the herbicide(s) can be covered under the PBO.

- **2,4-D amine**. 2,4-D amine acts as a growth-regulating hormone on broad-leaf plants, being absorbed by leaves, stems and roots, and accumulating in a plant's growing tips. If a Project Proponent uses 2,4 D amine, this action requires a 15-foot buffer when hand applied, and a 50-foot buffer when it is applied using a backpack sprayer.
- **Aminopyralid.** This is a relatively new selective herbicide first registered for use in 2005. It is used to control broadleaf weeds and is from the same family of herbicides as clopyralid, picloram and triclpyr. Aminopyralid is proposed to be used for the selective control of broadleaf weeds. Acute toxicity tests show aminopyralid to be practically nontoxic, with aquatic invertebrates showing more sensitivity. Thus, if aminopyralid does end up in surface waters, the most likely pathway of effect for fish is through loss of prey.
- **Chlorsulfuron.** This herbicide is used to control broadleaf weeds and some annual grasses. Chlorsulfuron is readily absorbed from the soil by plants. This herbicide does not bioaccumulate in fish. The buffers and application methods greatly minimize the risk of exposure to listed fish and their prey species.
- **Clethodim.** Clethodim is a post emergence herbicide for control of annual and perennial grasses and is applied as a ground broadcast spray or as a spot or localized spray. This Program is not allowing it for broadcast application; it is allowed for hand application and backpack sprayer, both with a 50-foot buffer.
- **Clopyralid.** Clopyralid is a relatively new and very selective herbicide. It is toxic to some members of only three plant families. It is very effective against knapweeds, hawkweeds, and Canada thistle. Clopyralid does not bind tightly to soil, and thus would seem to have a high potential for leaching. That potential is functionally reduced by the relatively rapid degradation of clopyralid in soil. It is one of the few herbicides that this Proposed Restoration Effort program proposes to allow up to the waterline (for hand application) but requires a 100-foot buffer for broadcast application. The Proposed Restoration Effort only allows for one treatment per year.

- **Dicamba**. Dicamba is proposed to control broadleaf weeds, brush, and vines. Broadcast application of Dicamba will not be allowed for any project because of issues associated with drift. Leaves and roots absorb dicamba and it moves through the plant. It should be applied during active plant growth periods, with spot and basal bark periodic application during dormancy. It does not bind to soil particles and microbes appear to be the primary source of chemical breakdown in soil.
- **Glyphosate 1 (aquatic)**. Glyphosate is a nonselective herbicide used to control grasses and herbaceous plants; it is the most commonly used herbicide in the world. It is moderately persistent in soil, with an estimated average half-life of 47 days (range of 1 to 174 days). Glyphosate is relatively nontoxic for fish. There is a low potential for the compound to build up in the tissues of aquatic invertebrates. The buffers and application methods greatly minimize the risk of exposure to fish and their prey species.
- **Imazapic.** Imazapic is used to control grasses, broadleaves, vines, and for turf height suppression in noncropland areas. Imazapic is proposed to be used for noxious weed control and rights-of-way management. Its use is proposed to be allowed up to the waterline with hand injection methods, 15-foot buffers for backpack sprayer application, and 100-foot buffers for broadcast application.
- **Imazapyr.** Imazapyr is used to control a variety of grasses, broadleaf weeds, vines and brush species. The buffers and application methods greatly minimize the risk of exposure to fish and their prey species.
- **Metsulfuron-methyl**. The Escort formulation is proposed. It is used to control brush and certain woody plants, broadleaf weeds, and annual grasses. It is active in soil and is absorbed from the soil by plants.
- **Picloram.** This is a restricted-use pesticide labeled for noncropland forestry, rangeland, right-of-way, and roadside weed control. It is a growth inhibitor and is used to control a variety of broadleaf weed species. It is absorbed through the leaves and roots and accumulates in new growth. The use of this herbicide is restricted to hand applications only (no broadcast applications) with a 25+-foot buffer and no use on sandy or riverwash soils. The buffers and application methods greatly minimize the risk of exposure to fish and their prey species.
- **Sethoxydim.** This herbicide is a selective post-emergence pesticide for control of annual and perennial grasses. Its mode of action is lipid biosynthesis inhibition. Project design criteria and conservation measures sharply reduce the risk of exposure. A 50-foot no-application buffer is proposed for both spot spraying and hand application, and a 100-foot buffer for broadcast application. Other factors such as wind speed and weather also reduce the risk of exposure. Thus, the risk of acute or chronic exposure to sethoxydim is low.
- **Sulfometuron-methyl.** At proposed application rates, sulfometuron-methyl is highly toxic to seedlings of several broadleaves and grasses. No chronic exposure is

anticipated to occur because the herbicide degrades relatively rapidly. Based on the proposed conservation measures, the risk of exposure to concentrations that result in acute lethal effects or chronic effects is low.

- **Triclopyr (TEA)**. The environmental fate of triclopyr has been studied extensively. This formulation of triclopyr is not highly mobile, although soil adsorption decreases with decreasing organic matter and increasing pH. With the exception of aquatic plants, substantial risks to nontarget species (including humans) associated with the contamination of surface water are low relative to risks associated with contaminated vegetation. The buffers and application methods greatly minimize the risk of exposure to fish and their prey species.

All-Species Protection Measures

ASP-1, Qualifications of the Qualified Biologist and USFWS-Approved Biologist. Biological monitoring and construction oversight will be provided by biologists at two different experience levels, depending on the activity. These two levels are described in this measure, below. In general, the Qualified Biologist will complete many tasks across species for a Proposed Restoration Project, and the USFWS-Approved Biologist will only be required for specific tasks that require additional species expertise. In some cases, the Qualified Biologist(s) may work under the guidance, direction, or supervision of the USFWS-Approved Biologist. Unless otherwise indicated in Section 2.1.5.3, *Guild- and Species-Specific Protection* Measures, general site surveys and biological monitoring can be conducted by a Qualified Biologist. Because the qualifications for the USFWS-Approved Biologist exceed those for the Qualified Biologist, any activity indicated as appropriate for the Qualified Biologist may also be completed by a USFWS-Approved Biologist.

- **Qualified Biologist**: The Qualified Biologist is required to meet certain qualifications, as confirmed by the Project Proponent. Résumé review by the USFWS is not required for the Qualified Biologist. Minimum qualifications for the Qualified Biologist include a bachelor's degree in biological or environmental science, natural resources management, or related discipline; field experience in the habitat types that may occur at the project site; familiarity with the Covered Species (or closely related species) that may occur at the project site; and prior preconstruction survey, construction monitoring, or construction oversight experience (if and as relevant to the activity to be conducted).
- **USFWS-Approved Biologist**: For some Covered Species, additional qualifications may be required for biologists who would be responsible for species handling or relocation, or other activities (Section 2.1.5.3, *Guild- and Species-Specific Protection Measures*). These activities would be completed by the USFWS-Approved Biologist when required by the protection measures. Résumé(s) for the USFWS-Approved Biologist(s) with experience in the identification of all life stages and ecology of the applicable Covered Species (or closely related species) and their critical habitat will be submitted to the USFWS Field Office for review and approval at least 30 days prior to any activity for which the protection measures indicate that a USFWS-Approved Biologist is required. Because

species handling and relocation of some species for proposed restoration projects would be authorized by USFWS through issuance of the PBO and associated ITS, it may not be a requirement for the USFWS-Approved Biologist to hold a federal Section 10(a)(1)(A) Recovery Permit to implement this role on an approved project under this program. However, it is noted that some presence/absence surveys that may be performed by a USFWS-Approved Biologist may require that the person conducting those surveys hold a Section 10(a)(1)(A) Recovery Permit. For any surveys, securing/confirming necessary 10(a)(1)(A) permits and other authorizations should be coordinated with the respective USFWS Field Office or S7 Delegated Authority Program (DAP).

ASP-2, Preconstruction Surveys. If Covered Species and/or their habitat is present, where appropriate and based on project-specific requirements, a Qualified Biologist will conduct visual preconstruction surveys and implement additional protection measures within 5 days prior to beginning work to protect the species and habitat from avoidable construction-related disturbance. The intent of the survey is to assess current species habitat and species use locations in the project area immediately prior to construction. The preconstruction survey is not intended to be a presence/absence or protocol-level survey; the potential for species presence would have already been evaluated prior to project approval. Pre-construction surveys may be phased across a construction site if construction in different areas will occur at different times; only areas where disturbance is imminent need be surveyed. If construction activities at a given location cease for more than 5 consecutive days, and there is potential for Covered Species to reoccupy habitat at that site, the Qualified Biologist will resurvey the project area prior to resuming construction and implement applicable protection measures. Additional guild- and species-specific preconstruction requirements are provided in Section 2.1.5.3, *Guild- and Species-Specific Protection* Measures*,* and may supersede this more GPM, as applicable.

ASP-3, Species Capture, Handling, and Translocation. Covered Species capture, handling, and translocation will only be conducted by a USFWS-Approved Biologist(s). The Project Proponent will prepare a Covered Species translocation plan to be reviewed and approved by the USFWS Field Office as part of the ESA Section 7(a)(2) Review Form. The plan will include capture and translocation methods, translocation site, and post translocation monitoring, if applicable. Additional measures are defined in Section 2.1.5.3, *Guild- and Species-Specific Protection Measures*. If capture, handling, and translocation are necessary due to dewatering activities, see IWW-6, *Dewatering/Diversion*, and follow the USFWS-Approved translocation plan. Additional guild- and species-specific capture, handling, and translocation requirements are described in Section 2.1.5.3, *Guild- and Species-Specific Protection Measures,* and may supersede this more GPM, as applicable.

ASP4, Covered Species Entrapment Prevention. To prevent the accidental entrapment of Covered Species during construction, all excavated, steep-walled holes or trenches will be covered with appropriate covers (e.g., plywood, thick metal sheets, or similar materials) at the end of each workday. Covers will be placed so that trench edges are fully sealed with rock bags, sand, or other appropriate material. Alternatively, one or more escape ramps (e.g., fill dirt or

wood planking) will be installed at an angle no greater than 30 degrees, to allow wildlife to escape. Before holes or trenches are filled, sealed, or collapsed, the holes or trenches will be thoroughly inspected for trapped animals. If pipes are stored on site or in associated staging areas, they will be capped when not in use or stored above ground level at an appropriate height to minimize species entrapment and will be inspected before being moved. Any animals discovered will be allowed to escape voluntarily or will be relocated by a USFWS-Approved Biologist. Additional guild- and species-specific entrapment prevention requirements are described in Section 2.1.5.3, *Guild- and Species-Specific Protection Measures,* and may supersede this more GPM, as applicable.

ASP-5, Airborne Noise Reduction. Equipment (including the noise abatement systems) will be maintained in good working order. If construction noise has the potential to adversely affect Covered Species, the Project Proponent will include site-specific protection measures for construction activities in the Project ESA Section 7(a)(2) Review Form to minimize impacts. Muffler (or spark arrester) damage must be promptly remedied.

Potential adverse effects from project-related noise should be avoided or minimized to the maximum extent practicable by implementing sufficient disturbance buffers between noise-generating project activities and covered amphibian, bird, and mammal species habitat. When applicable, species-specific noise buffer distances are provided in Section 2.1.5.3, *Guild and Species-Specific Protection Measures*. Noise buffer distances are distinct from other indicated buffer distances in Section 2.1.5.3, which may relate to an area involving dispersal, visual disturbance, or other considerations; however, incorporating the larger of two buffer distances will provide buffer for both purposes. Noise buffer distances may be modified in coordination with the USFWS Field Office based on project specific characteristics or a Project Proponent/Action Agency may choose to submit their own analysis and buffer recommendations for the USFWS's consideration. If sufficient buffers cannot be implemented, the proposed activities may lead to adverse effects, including possible incidental take.

Guild and Species-Specific Protection Measures

The overall process for identifying and compiling Species Protection Measures, as well as measures by guild, are provided in this section. In cases where the species protection measures are similar across multiple species, those measures have been grouped by guild for efficiency and to avoid duplicative text. The identified measures for each Covered Species or Covered Species group (e.g., riparian birds, vernal pool Branchiopoda, and riparian plants) are described in this section. Incidental take is allowed for some Covered Species, up to certain limits (Table 2), after implementation of applicable protection measures.

Development of Species Protection Measures

Species Protection Measures, as they apply to a particular project, are to be incorporated into the project descriptions for individual projects, in addition to applicable GPMs described in Section 2.1.5.2, *Programmatic General Protection Measures*. Applicable measures should be determined by the Action Agency and the Project Proponent in coordination with the respective USFWS Field Office/S7 Delegated Authority Program when completing the project

description/ESA Section 7(a)(2) Review Form. Action Agencies and Project Proponents should refer to Section 2.1.2, *Administration of the PBO,* for more detailed instructions about the administrative process for this consultation. Extended or alternative work windows may be considered on an individual project basis with prior approval from USFWS Field Office or S7 Delegated Authority Program, provided the Action Agency and Project Proponent can demonstrate that measures implemented to avoid or minimize exposure would do so at a level commensurate with the standard work windows.

It is worth highlighting here that CDFW staff provided review of protection measures for dually listed (species that are both listed by the USFWS and by the State of California) and species of special concern (CNDDBa and CNDDBb 2022 or most recent version and available online at https://wildlife.ca.gov/Conservation/CESA). The language used in the PBA represents the collective response for those species where differences needed to be reconciled. This coordination effort with CDFW was intended to improve state/federal coordination and provide efficiency for CDFW in their project approval processes.

In addition, CDFW staff had previously reviewed the eligible project type descriptions as part of this Statewide Multi-Agency Effort to develop coordinated, expedited programmatic authorizations or permits for eligible restoration projects in California.

Please note the following points regarding the organization of the Species Protection Measures:

- The Covered Species are listed by guild in the following order: 1) amphibians, 2) reptiles, 3) birds, 4) mammals, 5) invertebrates (shrimp species, beetles, and butterflies), 6) fish, and 7) plants.
- Under most guilds, general measures that apply to an entire guild were developed, followed by measures that are applicable to a single species or a smaller group of species. Both the measures for a specific guild and for a single or smaller group of species would need to be evaluated for their applicability to avoid and minimize impacts to a Covered Species.
- The nomenclature used for the Species Protection Measures consists of the acronym for the Covered Species, plus a sequential number. For example, for the arroyo toad, the protection measures are named ARTO-1, ARTO-2, ARTO-3, etc. For groups of species, the nomenclature consists of an acronym for the group, plus a sequential number. For example, for a group of amphibians, the protection measures all use the group name "Amphibians" and are named AMP-1, AMP-2, AMP-3, etc.
- For ease of implementation, the protection measures described for each species are listed in chronological order of project implementation activities (i.e., design, surveys, avoidance, work windows, work restrictions, implementation monitoring, and revegetation monitoring).
- Similar to the approach to animal species protection measures, the approach to plant protection measures is intended to provide Project Proponents with coverage under the PBO, without the need for additional consultation or project-specific biological opinion preparation. Protection measures for plants primarily consist of avoidance measures. When complete avoidance of species with an LAA determination is not possible, additional protection measures have been included in the sections below.

Amphibians

There are eleven federally-listed amphibian species being addressed in this PBO. A list of these amphibian species is provided in Table 5. The General Amphibian Protection Measures described in this section are applicable to all species identified in Table 5. In addition, Species Protection Measures are provided in this section for individual species and—in some instances—groups of species, to avoid or minimize potential adverse effects.

Table 5: Covered Species – **Amphibians**
Self-Imposed Annual Take Limits and Effects Determinations

Common Name	Annual Take Limits	ESA Effects Individuals	ESA Effects Critical Habitat
arroyo toad	No more than 10 adults or juveniles injured or killed; 5% of larval captures killed or injured; 2 egg strands damaged or destroyed annually.	LAA	LAA
California red-legged frog	No more than 60 terrestrial adults or juveniles injured or killed outside of the Sierra Nevada (shared between Field Offices), 5 terrestrial adults or juveniles injured or killed for locations within the Sierra Nevada; and 5% of larval captures injured or killed annually.	LAA	LAA
California tiger salamander – Central California DPS	No more than 20 adults or juveniles injured or killed annually and no more than 10 per Field Office; No more than 5% of larval captures injured or killed annually.	LAA	LAA
California tiger salamander – Santa Barbara County DPS	No more than 5 adults or juveniles injured or killed annually and no more than 5% of larval captures killed or injured per pond annually.	LAA	LAA
foothill yellow-legged frog	No more than 20 adults or juveniles injured or killed annually and no more than 10 per Field Office. No more than 5% of larval captures injured or killed annually. Individual projects will be designed/implemented to not adversely affect a significant portion of the population in the project area.	LAA	Not Applicable

mountain yellow-legged frog – northern California DPS	No more than 20 adults or juveniles injured or killed annually and no more than 10 per Field Office. No more than 5% of larval captures injured or killed annually. Individual projects will be designed/implemented to not adversely affect a significant portion of the population in the project area.	LAA	LAA
Santa Cruz long-toed salamander	No more than 5 adults or juveniles injured or killed annually. No more than 5% of larval captures killed or injured per pond annually.	LAA	Not Applicable
Sierra Nevada yellow-legged frog	No more than 20 adults or juveniles injured or killed annually and no more than 10 per Field Office annually. No more than 5% of larval captures injured or killed annually. Individual projects will be designed/implemented to not adversely affect a significant portion of the population in the project area.	LAA	LAA
western spadefoot – Northern DPS	No more than 50 adults or juveniles injured or killed annually. No more than 5% of larval captures injured or killed per pond annually.	LAA	Not Applicable
western spadefoot – Southern DPS	No more than 40 adults or juveniles injured or killed annually. No more than 5% of larval captures injured or killed per pond annually.	LAA	Not Applicable
Yosemite toad	No more than 20 adults or juveniles injured or killed annually and no more than 10 per Field Office annually. No more than 5% of larval captures injured or killed annually. Individual projects will be designed/implemented to not adversely affect a significant portion of the population in the project area.	LAA	LAA

Notes:

Limits reset on January 1 each year. Limits apply to the entire range of the species (range-wide), unless otherwise indicated.

General Amphibian Protection Measures

In addition to these General Amphibian Protection Measures, several GPMs, as applicable, are important to protect these species. These GPMs include—but are not limited to—GPM2,

Construction Work Windows; GPM3, *Construction Hours*; GPM4, *Environmental Awareness Training*; GPM5, *Environmental Monitoring*; GPM6, *Work Area and Speed Limits*; GPM7, *Environmentally Sensitive Area and/or Wildlife Exclusion*; GPM9, *Practices to Prevent Pathogen Contamination*; ASP1, *Qualifications of the Qualified Biologist and USFWS-Approved Biologist*; ASP2, *Preconstruction Surveys*; ASP3, *Species Capture, Handling, and Translocation*; ASP4, *Entrapment Prevention*; WQHM3, *Erosion Control Plans*; WQHM4, *Hazardous Materials Management and Spill Response Plan*; and VHDR6 and VHDR7 (for herbicide use).

The following measures, as they apply to a particular project, will be incorporated into the project descriptions for individual projects that may affect any of the covered amphibian species provided in Table 5 and authorized under the PBO.

AMP-1, *Wildlife Passage Design.* For projects that include the installation, repair, or replacement of permanent or temporary fencing (e.g., security, landscape, or privacy fencing) fencing will be designed to allow for permeability; it will incorporate a minimum 6-inch gap at regular intervals to allow for covered amphibians to disperse between upland and breeding habitat. This measure is not applicable to ESAF or WEF specified as part of construction activities to protect habitats or exclude wildlife from the work areas. Facilities such as curbs, drainages, culverts, and fence "footers" will be designed with gradually sloped sides or intermittent gaps to facilitate wildlife movement.

AMP-2, *Rain Event Limitations.* To the maximum extent practicable, construction activities will be restricted to periods of low rainfall (less than 0.5 inch per 24--hour period) and periods of dry weather (with less than a 50% chance of rain). During these restricted periods, no construction activities will occur between 30 minutes prior to sunset and 30 minutes after sunrise (no night work during rain events). If rain exceeds 0.5 inch during a 24-hour period, work will cease until no further rain is forecast. Construction activities halted due to precipitation may resume when precipitation ceases and the National Weather Service 72-hour weather forecast indicates less than a 50% chance of 0.5 inch of rain or less during a 24--hour period. Before construction activities resume, a Qualified Biologist will inspect the project area and all equipment/materials for the presence of Covered Species of amphibians.

AMP-3, *Preconstruction Survey.* If covered amphibians are present or assumed present,[3] no more than 24 hours prior to the date of initial ground disturbance and vegetation clearing, a USFWS-Approved Biologist will walk in the project site to investigate all potential areas that could be used by the Covered Species of amphibians (as identified in Table 5) for feeding, breeding, sheltering, movement, and other essential behaviors. If a covered amphibian species is encountered during the survey, the Project Proponent will refer to and follow procedures described below in AMP-9*, Encounters with Species*; and AMP-10*, Species Observations and Handling Protocol*, for passively allowing the species to move out of the work area or actively relocating the species out of harm's way. Proposed restoration projects that may need to actively relocate amphibians out of harm's way will require the Project Proponent to submit a project-specific species relocation plan for USFWS review and approval, as described in AMP-10.

[3] The Project Proponent will assume a species is present in an area when suitable habitat is present within the current range of the species and their absence has not been determined by a negative finding using protocol level surveys.

AMP-4*, Disease Prevention and Decontamination.* To prevent disease conveyance among work sites during project implementation, the USFWS-Approved Biologist will ensure that the decontamination protocols described in CDFW, Aquatic Invasive Species Disinfection/ Decontamination Protocols (CDFW 2016 or latest version) will be implemented prior to gear and equipment arriving at or moving between work sites and will be followed at all times. A copy of the code of practice must be available at the project site.

AMP-5*, Lighting.* In addition to GPM-*3, Construction Hours*, artificial lighting at a project site will be prohibited to the maximum extent practicable during the hours of darkness, except when necessary for driver or pedestrian safety.

AMP-6*, Clearing and Grubbing Vegetation.* A USFWS-Approved Biologist will be present during all vegetation clearing and grubbing activities in areas within the currently occupied range of Covered Species of amphibians where suitable habitat is present. Before vegetation removal, the USFWS-Approved Biologist will thoroughly survey the area for these species (see AMP-3, *Preconstruction Survey)*. Either vegetation in sensitive areas will be cleared with handheld motorized tools (e.g., weed eaters or chainsaws) or by hand pulling; or a USFWS-Approved Biologist will walk in front of vegetation-clearing equipment. Where dense brush occurs (e.g., blackberry or periwinkle), the USFWS-Approved Biologist may direct an equipment operator to lift and shake dense vegetation with an excavator or backhoe so that the USFWS-Approved Biologist can look underneath and search for amphibians. Tree stumps and roots will be left in place to avoid any ground disturbance and preserve refugia habitat, with the exception of nonnative invasive plants that could propagate from remaining vegetative material. Native branches, leaf litter, mulch, woody debris, and other vegetative trimmings may be retained and spread on site to enhance habitat, as appropriate.

AMP-7*, Pump Screens.* If a waterbody is to be temporarily dewatered by pumping, intakes will be completely screened, consistent with NMFS (1997) and CDFW (2001) screening guidelines or latest updates to those guidelines (currently, where fry-sized salmonids are present, wire mesh openings no larger than 3/32 inch [2.38 mm] for woven wire or perforated plate screens, or 0.0689 inch [1.75 mm] for profile wire screens, and other relevant criteria such as limited approach velocities), to avoid entrainment or impingement of larval amphibians. The intake will be placed in a perforated bucket or another method to attenuate suction, to prevent Covered Species of amphibians from entering the pump system. Water will be returned to the water body when diversions or cofferdams are removed and flow is restored (consistent with measures in Section 2.1.5.2.2, *Dewatering Activities and Aquatic Species Relocation*). If no diversion or cofferdams are used during dewatering, the waterbody will be allowed to refill naturally from precipitation, runoff, or hydrological processes.

AMP-8*, Removal of Nonnative Invasive Species.* Removal of any individuals of nonnative invasive species (e.g., bullfrogs, nonnative crayfish, or nonnative fishes) is encouraged as practicable to facilitate conditions for project success. The Project Proponent is responsible for ensuring that these activities comply with the California Fish and Game Code. Suspected hybrid California tiger salamander will not be removed without specific authorization from USFWS (and CDFW, in accordance with their requirements). More details on nonnative animal removal are provided below.

1. In federally-listed aquatic species occupied habitat, a USFWS-Approved Biologist will be present during removal activities. Less experienced personnel assisting with removal efforts will get confirmation of species identification of all vertebrates prior to collection and removal.
2. All individuals participating in removal activities will have training in identification of Covered Species that might be present and nonnative species proposed for removal and proper techniques for all planned removal methods prior to the initiation of removal activities.
3. Crew size, along with the amount of time spent in any given habitat area, will be kept to the minimum necessary. Repeated disturbance of any given area within a single year will be avoided unless necessary for eradication purposes.
4. To the extent feasible, both native and nonnative fauna will be examined for signs of diseases or parasites soon after capture, and any abnormalities will be photographed and documented.
5. Prior to initiation of electrofishing activities in Covered Species habitat, the names and credentials of all electrofishing crew leaders will be submitted for review and approval by USFWS.
6. The USFWS-approved electrofishing crew leader will provide training to the crew regarding potential risks associated with electrofishing and injury to Covered Species. The crew will also be trained to identify signs of injury and appropriate response.
7. Electrofishing will be conducted using the minimum pulse rate and width that is effective. Only direct or pulsed direct current will be used. In shallow waters, undercut banks, near algal mats or other areas where Covered Species can be concentrated or are more likely to come into close contact with electrofishing equipment, the amount of time spent electrofishing will be minimized.
8. If any Covered Species are immobilized by electrofishing activities, they will be carefully removed from the water body by a USFWS-Approved Biologist until activities are completed. These individuals will be held for the minimum amount of time necessary and monitored until they are completely mobile and then returned to the point of capture.
9. Handling of individuals (e.g., arroyo toad, California red-legged frog) may occur if they are inadvertently collected by net or trap, in accordance with procedures for handling in AMP-11 and FISH-3. These individuals will be released at the place of capture or will be relocated to the nearest available suitable habitat.
10. Gill nets will be used upstream and downstream of occupied stream stretches, but not in stream stretches where Covered Species might occur. Where gill nets are used, they will not be left unattended overnight
11. If traps are used, they will be carefully monitored to minimize the potential for injury and mortality of nontarget species. Fish traps will be used under the following conditions: (a) fish traps will be checked a minimum of once a day; (b) fish traps will be set so that air will be available at the top of the trap; and (c) if predator tracks

adjacent to or signs of predator tampering with fish traps occur, these traps will be closed for a period of time until predator activity is no longer detected.

AMP-9*, Placement of Suitable Erosion Control Material.* To prevent amphibians from becoming entangled, trapped, or injured, erosion control materials that use plastic or synthetic monofilament netting will not be used. Silt fencing can be used because it is not considered a netting and does not entangle species. This includes products that use photodegradable or biodegradable synthetic netting, which can take several months to decompose. Acceptable materials include natural fibers such as jute, coconut, twine, or other similar fibers. Following site restoration, erosion control materials such as straw wattles will not block the movement of Covered Species of amphibians.

AMP-10*, Encounters with Species.* Each encounter with a covered amphibian will be treated on a case-by-case basis. If any life stage of the Covered Species of amphibian is found and these individuals may potentially be killed or injured by work activities, the following will apply:

a. If a Covered Species of amphibian is detected in the project area, work activities within 50 feet of the individual that may potentially be harmed, injured, or killed will cease immediately, and the USFWS-Approved Biologist will be notified. Based on the professional judgment of the USFWS-Approved Biologist, if project activities can be conducted without harming or injuring the species, it may be left at the location of discovery and monitored by the USFWS-Approved Biologist. All project personnel will be notified of the finding, and at no time will work occur within 50 feet of a species without a USFWS-Approved Biologist present.

b. Contact with the Covered Species of amphibian will be avoided, and the amphibian will be allowed to move out of the potentially hazardous situation of its own volition. Allowing a Covered Species of amphibian to move out of the potentially hazardous situation of its own volition may not be appropriate for multi-day projects because covered amphibians could stay or move back into the project site. If there is an immediate hazard or if there is no suitable, accessible habitat nearby to which the amphibian may relocate, the amphibian will be moved following approved handling protocol (see AMP-11, *Species Observations and Handling Protocol*).

c. Not to exceed the self-imposed take limits provided in Table 4.

AMP-11, *Species Observations and Handling Protocol.* The potential need to handle and relocate covered amphibian species should be evaluated during the technical assistance step shown in Figure 2. If a Covered Species of amphibian (as identified in Table 5) does not or cannot leave the work area and handling covered amphibians (as identified in Table 5) is required, capture and relocation will only be allowed in accordance with a plan developed in accordance with the guidance below and submitted to USFWS for review and approval. Although it could be submitted after the ESA Section 7(a)(2) Review Form, to avoid project delays and facilitate timely USFWS review and approval, a draft of the capture and relocation plan may be submitted with the ESA Section 7(a)(2) Review Form. The capture and relocation

will be conducted by a USFWS-Approved Biologist. In addition to measures described in GPM-9*, Practices to Prevent Pathogen Contamination*; and AMP-5*, Clearing and Grubbing Vegetation* (which refers to CDFW [2016] decontamination protocols), to prevent the spread of pathogens among sites, special care should be taken to prevent transferring potential pathogens among individual animals, as described below.

a. Prior to handling and relocation, the USFWS-Approved Biologist will take precautions to prevent the introduction of amphibian diseases, in accordance with the *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* (USFWS 2003).

    i. All dirt and debris, including mud, snails, plant material (including fruits and seeds), and algae, should be removed from nets, traps, boots, vehicle tires and all other surfaces that have come into contact with water. Cleaned items should be rinsed with clean water before leaving the work area.
    ii. Boots, nets, traps, etc., should then be scrubbed with either a 70% ethanol solution, a bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water), QUAT 128 (quaternary ammonium, use 1:60 dilution), or a 6% sodium hypochlorite 3 solution and rinsed clean with water between study sites. Cleaning equipment in the immediate vicinity of a pond or wetland should be avoided. Care should be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat.
    iii. When working at sites with known or suspected disease problems, disposable gloves should be worn and changed between handling each animal.
    iv. Used cleaning materials (liquids, etc.) should be disposed of safely, and if necessary, taken back to the lab for proper disposal. Used disposable gloves should be retained for safe disposal in sealed bags.

b. Disinfecting equipment and clothing is especially important when biologists are coming to the project area to handle amphibians after working in other aquatic habitats (see *GPM-9* and *AMP-5*, which reference CDFW [2016] protocols). Covered amphibians will also be handled and assessed according to the Restraint and Handling of Live Amphibians (USGS 2001).

Covered amphibians will be captured by hand, dip net, seine net, or other USFWS-Approved methodology, transported and relocated to nearby suitable habitat outside of the work area, and released as soon as practicable the same day of capture. Soaps, oils, creams, lotions, repellents, or solvents of any sort cannot be used on hands within two hours before and during periods when the biologist is capturing and relocating individuals. Individuals will be relocated to areas containing suitable habitat, as identified in the relocation plan. If the animal will be held in captivity for any length of time, they shall be kept in a cool, dark, moist environment with proper airflow, such as a clean and disinfected bucket or plastic container with a damp sponge. Holding/transporting containers will not contain any standing water, objects (except sponges), or chemicals. Holding/transporting containers and dip nets will be thoroughly cleaned, disinfected, and rinsed with fresh water prior to use in the project area (see CDFW 2016 for disinfection

protocols). USFWS will be notified (e.g., via phone, email, or text message) as soon as practicable and no longer than 1 week after all capture, handling, and relocation efforts.

If an injured covered amphibian is encountered, and the USFWS-Approved Biologist determines that the injury is minor or healing and the individual is likely to survive, the individual will be released immediately, consistent with measures above. The individual(s) will be monitored until it is not imperiled by predators or other dangers.

If the USFWS-Approved Biologist determines that a covered amphibian has major or serious injuries as a result of project-related activities, the USFWS-Approved Biologist will take it to a USFWS-Approved facility as soon as practicable, if such a facility is within a reasonable distance from the project site. If taken into captivity, the individual will remain in captivity and not be released into the wild unless it has been kept in quarantine and the release is authorized by USFWS. The circumstances of the injury, the procedure followed, and the final disposition of the injured animal will be documented in a written incident report to USFWS, as described below.

Notification to USFWS of an injured or dead covered amphibian (as identified in Table 5) in the project area will be made and reported, whether or not its condition resulted from project-related activities. In addition, the USFWS-Approved Biologist or Project Proponent will follow up with USFWS in writing (e.g., email) within 2 calendar days of the finding. Written notification to USFWS will include the following information: the species; number of animals taken or injured; sex (if known); date, time, and location of the incident or of the finding of a dead or injured animal; how the individual was taken; photographs of the specific animal; the names of the persons who observe the take and/or found the animal; and any other pertinent information. Dead specimens will be preserved, as appropriate, and will be bagged and labeled (i.e., species type; who found or reported the incident; when the report was made; when and where the incident occurred; and, if possible, the cause of death). Specimens will be held in a secure location until instructions are received from USFWS regarding the disposition of the specimen.

Arroyo Toad

ARTO-1, *Conduct Habitat Assessment.* A habitat assessment will be conducted by a Qualified Biologist to determine whether the project area contains suitable habitat for the arroyo toad. If suitable habitat for this species is identified and the proposed project may affect suitable habitat that is *not* known to be occupied by the arroyo toad, the appropriate USFWS Office will be contacted regarding the need for surveys according to USFWS protocol (USFWS 1999a), and those surveys will be conducted, as appropriate. Alternatively, the Project Proponent may choose to implement the following avoidance measures for this species, based on the presence of suitable habitat, without confirming the presence or absence of the species by conducting protocol surveys.

ARTO-2, *Work Window.* To minimize effects to breeding arroyo toads, all project activities in occupied breeding habitat will occur outside the breeding season (i.e., the breeding season is March 15 through July 15 for arroyo toad).[4] In addition:

a. If the breeding season cannot be avoided, a USFWS-Approved Biologist will conduct surveys no more than 24 hours before project work. If no arroyo toads of any life stages or clutches are found in the project area, project activities may proceed.

b. If the breeding season cannot be avoided and arroyo toads are found in the project area, a USFWS-Approved Biologist will conduct daily surveys before project work begins until the beginning of the nonbreeding season, or until project activities have ceased.

c. If a project is in an occupied area, use of heavy machinery will be avoided when juvenile arroyo toads are known to occupy the bordering banks of suitable water features (i.e., April 15 through October 1), thereby further reducing the preferred work window described above in ARTO-2, for use of heavy machinery, to the period between October 2 and March 14. Use of heavy equipment may commence prior to October 2 if surveys demonstrate that juvenile toads have metamorphosed and moved away from the breeding habitat, and juvenile toads have not been found on the banks of breeding habitat for more than 30 days.

d. Not to exceed the self-imposed take limit of 10 adults or juveniles injured or killed annually, five% of larval captures killed or injured annually, two egg strands damaged or destroyed annually.

California Red-Legged Frog and California Tiger Salamander (Central California DPS and Santa Barbara DPS)

CRLF-CTS1, *Work Windows.* For the California red-legged frog and California tiger salamander, project activities in uplands will be confined to May 1 through October 31, [8] unless there is a rain event forecast likely to generate measurable fall, rain of 1 inch or greater, at which time work will cease for the fall season. For project activities in occupied aquatic breeding habitat, grading and other disturbance will avoid the breeding season and will be limited to between July 1 and October 31, unless preconstruction surveys and monitoring demonstrate that young-of-year (recently metamorphosed) amphibians have dispersed from the breeding habitat. In that case, based on the recommendation of the USFWS-Approved Biologist, and with written approval from the USFWS (e.g., email), the Project Proponent may proceed with work in aquatic breeding habitat prior to July 1. Work in a pool or wetland may also begin before July 1 if the pool or wetland has been dry for a minimum of 30 days before initiating work. Not to exceed the self-imposed take limits in Table 5 *Covered Species - Amphibians*.

CRLF-CTS-2, *Nonnative Animal Removals.* During electrofishing activities, in or near California red-legged frog occupied habitat, a USFWS-Approved Biologist will precede the electrofishing

[4] Extended or alternative work windows may be considered on an individual project basis with prior approval from USFWS ES, provided the Project Proponent can demonstrate that measures implemented to avoid or minimize exposure would do so at a level commensurate with the standard work windows.

crew and survey for California red-legged frogs. If any California red-legged frogs are detected, they will be captured and held outside the waterbody until the electrofishing activities at that location have been completed. All individuals would then be immediately returned to the point of capture. California red-legged frog tadpoles will not be removed from habitat during electrofishing. If a tadpole is shocked then it should be captured (e.g., placed in shallow container) and monitored until it regains function, and then released at point of capture. If it does not regain function then should be reported as a mortality. If California red-legged frogs are detected but escape capture, the USFWS-Approved Biologist will determine measures for avoiding or minimizing impacts to individuals (i.e., leave the area or limit the duration of shocking pulses).

Sierra Nevada Yellow-Legged Frog, Mountain Yellow-Legged Frog (Northern California DPS), and Foothill Yellow-Legged Frog

SNYLF-MYLF-FYLF-1, *Work Windows.* For projects where the Sierra Nevada yellow-legged frog, mountain yellow-legged frog, and foothill yellow-legged frog are known or assumed to occur, project activities in uplands areas will be confined to August 1 through October 31.[8] Not to exceed the self-imposed take limits in Tables 4 and 5.

For project activities in occupied aquatic breeding habitat that typically dries before the end of autumn, grading and other disturbance will be confined to May 1 through November 15, and to when the breeding habitat feature (or portion of the feature where work would occur) has been dry for a minimum of 30 days before initiating work.[8]

These frogs have a multi-year larval development stage and are present in aquatic breeding habitat year-round. Therefore, project activities in occupied aquatic breeding habitat that does not dry before the end of autumn will be confined to May 1 through November 15[5] and will require a USFWS-Approved capture and relocation plan (see AMP-11, *Species Observations and Handling Protocol*) prior to initiating grading and other disturbance in the aquatic breeding habitat. Dewatering sites will be located and timed to avoid and minimize adverse effects to instream flows and depletion of pool habitat.

SNYLF-MYLF-FYLF-2, *Water Temperature.* Project activities will not result in long-term deleterious changes to water temperatures in occupied or potential habitat.

SNYLF-MYLF-FYLF-3, *Borrow Site Sediment Control.* Any borrow sites used will be developed so that the topsoil is removed and piled at the base of the slope to act as a berm catching any sediment that may be transported down slope. For most of the period during borrow, the slope will have a low basin at the base of the borrow area that can be substituted as a sediment pond (if needed) during a storm event. If applicable, all remaining spoils not used during construction will be hauled off site and deposited in stable areas once construction is complete.

Yosemite Toad

YOTO-1, *Work Windows.* For projects where the Yosemite toad is known or assumed to occur, construction within 1,000 feet of occupied (known or suspected) breeding habitat will begin no

[5] Extended or alternative work windows may be considered on an individual project basis with prior approval from USFWS ES, provided the Project Proponent can demonstrate that measures implemented to avoid or minimize exposure would do so at a level commensurate with the standard work windows.

sooner than 15 days after the breeding habitat is dry or the last larvae has metamorphosed (typically between July 15 and September 15). Habitat condition and Yosemite toad developmental stage will be determined on a site-specific, annual basis, either by coordinating with the USFWS or others conducting Yosemite toad monitoring, or through project-specific surveys or monitoring. Occupied breeding habitat will not be dewatered while larval Yosemite toads are present.

All construction activity within 1,000 feet of occupied habitat (known or suspected) will end prior to October 1 to allow for overwintering migrations and protection of overwintering Yosemite toads. End date timing may be adjusted from October 1 to October 15, if approved in writing (e.g., email) by USFWS. Adjustment of end date timing may be based on temperatures and toad activity observed in September, during construction monitoring, and on forecasted temperatures for early October.

Not to exceed the self-imposed take limit of no more than 20 adults or juveniles injured or killed annually and no more than 10 per Field Office annually; no more than 5% of larval captures injured or killed annually. Individual projects will be designed/implemented to not adversely affect a significant portion of the population in the project area.

YOTO-2*, Water Temperature.* Project activities will not result in long-term changes to water temperatures and will not adversely modify microhabitat conditions important to Yosemite toad, including shallow flow through wet meadows and pool habitat in wet meadows.

YOTO-3*, Borrow Site Sediment Control.* Any borrow sites used will be developed so that the topsoil is removed and piled at the base of the slope to act as a berm catching any sediment that may be transported down slope. For most of the period during borrow, the slope will have a low basin at the base of the borrow area that can be substituted as a sediment pond, if needed, during a storm event. If applicable, all remaining spoils not sued during construction will be hauled off site and deposited in stable areas once construction is complete.

YOTO-4*, Lupine Areas.* Where possible, open, dry lupine areas with rodent burrows will be avoided. Projects shall not use open and dry lupine areas as turn-around locations, vehicle storage, or equipment staging unless first surveyed and rodent burrows are absent. If walking through these sites, avoid walking where numerous rodent burrows and lupine are observed. Minimize trips and only use one access route if access is needed.

YOTO-5*, Debris Disposal and Piling.* Debris (e.g., vegetation, rocks, or logs) from the proposed project will be put in appropriate locations that do not damage suitable upland habitat, remove cover components, or create dispersal barriers. Vegetation and tree materials will not be scattered, they will be piled. No piling of slash or debris within meadows, streams, or riparian vegetation. When selecting locations for piles that may be within 1,000 feet of known occupied toad meadows, avoid piling in open, dry areas with lupine unless the area is surveyed and there are no rodent burrows present. Do not pile on or within 20 feet of old stumps.

YOTO-6*, Burning Piles.* If piles will be burned, they shall be ignited using a pattern that allows animals to escape the fire. For example, light the pile from the top, leaving the bottom perimeter unignited to serve as an escape route. Slash or debris piles located within 300 feet of occupied

toad meadows should be burned in the fall to minimize impacts to terrestrial habitats and spring dispersal of adult toads. If burning needs to occur in the spring, additional site-specific measures will be developed to ensure maximum protection of individual toads that may be in the area.

Santa Cruz Long-Toed Salamander

SCLTS-1, *Habitat Impact Avoidance.* Projects requiring ground disturbance in known or potentially occupied suitable habitat for Santa Cruz long-toed salamander (e.g., isolated ponds) will require submittal of detailed project design information in the ESA Section 7(a)(2) Review Form for review and approval from USFWS. Not to exceed the self-imposed take limit of no more than five adults or juveniles injured or killed annually and no more than 5% of larval captures killed or injured per pond annually.

SCLTS-2, *Work Windows*. For the Santa Cruz long-toed salamander, project activities in uplands will be confined to April 15 through October 31, unless there is a rain event forecast likely to generate measurable rainfall (rain of 1 inch or greater) at which time work will cease for the fall season. For project activities in occupied aquatic breeding habitat, grading and other disturbance will be limited to when the breeding habitat is dry.[6]

Western Spadefoot (Northern DPS and Southern DPS)

WSF-1, *Upland Burrow Avoidance*: Project activities in suitable upland habitat that contain known or potentially occupied western spadefoot burrows will avoid noise disturbance or excess vibration to the maximum extent possible to prevent aestivating adults to emerge from burrows at inappropriate times that could cause desiccation or increased predator exposure.

WSF-2, *Work Windows.* Activities within 250 feet of western spadefoot breeding habitat will take place from July 1 through October 15 to avoid the western spadefoot breeding season. Activities will be timed so that work within pools or ponds are conducted when they are dry and no recent metamorphs/toadlets are present in cracked soil. Work in this work window is only allowed if vernal pools remain dry for 72 hours. If there is a 70% or greater forecasted rain event of 0.1-inch or more in a 24-hour period, work activities will be postponed until site conditions are dry. Work will be conducted only in daylight.

Project activities within suitable upland habitat that may support western spadefoot will take place from January 1 to May 1 (depending on seasonal rains) during the western spadefoot breeding season when the species is typically more active and closer to breeding habitat, unless preconstruction surveys and monitoring demonstrate that both suitable breeding and upland habitats are present in the project area. In that case, based on the recommendation of the USFWS-Approved Biologist, and with written approval from the USFWS (e.g., email), the Project Proponent may proceed with work in upland habitat outside of this work window.

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[6] Extended or alternative work windows may be considered on an individual project basis if approval by USFWS ES is applied for in advance and the Project Proponent can demonstrate that measures implemented to avoid or minimize exposure would do so at a level commensurate with the standard work windows.

Work will be conducted only in daylight.

WSF-3, *Preconstruction Surveys.* A Qualified Biologist will conduct preconstruction surveys for suitable habitat for western spadefoot in the project area, with a focus on suitable water features, including but not limited to, ephemeral features (e.g. vernal pools and drainage ditches), permanent features (e.g. natural ponds and stock ponds), surrounding hydrologic or geographic features that support inundation during rain events, and associated upland habitat (grasslands and other areas with seasonally friable soils that support burrows). At least three surveys for western spadefoot of any life stage will be conducted.

Nighttime surveys (assuming eggs, larvae, and/or juveniles have not been detected) will be conducted by walking slowly and carefully along water features and between suspected breeding habitats after a rain event of at least 0.25 inch within a 48-hour period. Contact the USFWS for the most recent protocol or guidance on conducting surveys for the western spadefoot.

Potential vernal pools and seasonal wetlands will be assumed present unless appropriate surveys during the wet season (i.e. when ponding is most likely to be evident) or other evidence demonstrates the aquatic feature is not present (see AMP-3, *Preconstruction Survey).*

WSF-4, *Environmentally Sensitive Areas and Wildlife Exclusion*. Wildlife exclusionary fencing (WEF) will be installed around the perimeter of all work areas within potential western spadefoot breeding and non-breeding habitat (up to 1,500 feet away from breeding habitat) as determined by a Qualified Biologist.

Fencing will consist of woven nylon fabric at least 2 feet in height and attached to wooden stakes. The lower 1 foot of material will stretch outward along the ground and be secured with a continuous line of sandbags to prevent soil disturbance and burrowing beneath the fence. All fencing materials will be maintained during construction and completely removed after construction is completed. The fencing will be inspected by a Qualified Biologist before the start of each workday and maintained by the Project Proponent until completion of the project. The fencing will be removed after all construction equipment is removed from the project site (see GPM-7, *Environmentally Sensitive Areas and/or Wildlife Exclusion*).

Reptiles

There are five federally-listed reptile species being addressed in this PBO. A list of these reptile species is provided in Table 6. The General Reptile Species Protection Measures described in this section are applicable to all species identified in Table 6. In addition, Species Protection Measures are provided in this section for individual species, to avoid or minimize potential adverse effects.

Table 6: Covered Species **– Reptiles**
Self-Imposed Annual Take Limits and Effects Determinations

Common Name	Annual Limits	ESA Effects Individuals	ESA Effects Critical Habitat
Alameda whipsnake (striped racer)	Injury or mortality to no more than 4 adults or juveniles/hatchlings annually. No net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.	LAA	LAA
giant garter snake	Injury or mortality to no more than 4 adults or juveniles/hatchlings annually. No net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.	LAA	Not Applicable
northwestern pond turtle	Injury or mortality to no more than 20 adults/juveniles and 30 hatchlings annually. No more than 2% of captures injured or killed per pond annually. No more than 25 acres of temporary nesting habitat lost and 2 acres of permanent nesting habitat lost annually.	LAA	Not Applicable
San Francisco garter snake	Injury or mortality to no more than 4 adults or juveniles/hatchlings annually. No permanent loss of hibernacula.	LAA	Not Applicable
southwestern pond turtle	Injury or mortality to no more than 10 adults/juveniles and 10 hatchlings annually. No more than 2% of captures injured or killed per pond annually. No more than 25 acres of temporary nesting habitat lost and 2 acres of permanent nesting habitat lost annually.	LAA	Not Applicable

Notes:

Limits reset on January 1 each year. Limits apply to the entire range of the species (range-wide), unless otherwise indicated.

LAA = ESA determination of may affect, and is likely to adversely affect

General Reptile Protection Measures

In addition to these General Reptile Protection Measures, several GPMs (as applicable) are important to reduce potential effects on the species listed in Table 6. These GPMs include but are not limited to GPM-2, *Construction Work Windows*; GPM-3, *Construction Hours*; GPM-4, *Environmental Awareness Training*; GPM-5, *Environmental Monitoring*; GPM-6, *Work Area and Speed Limits*; GPM-7, *Environmentally Sensitive Area and/or Wildlife Exclusion*; ASP-1, *Qualifications of the Qualified Biologist and USFWS-Approved Biologist*; ASP-2, *Preconstruction Surveys*; ASP-3, *Species Capture, Handling, and Translocation*; ASP-4, *Entrapment Prevention*; WQHM-3, *Erosion Control Plans*; WQHM-4, *Hazardous Materials Management and Spill Response Plan*; and VHDR-6 and VHDR-7 (for herbicide use).

The following general reptile protection measures should be considered for inclusion in the project if the project may affect any of the covered reptile species listed in Table 6.

REP-1*, Preconstruction Survey.* A Qualified Biologist will conduct preconstruction surveys for the target reptile species within 72 hours prior to any initial ground disturbance in all suitable habitat in or adjacent to the project site and accessible to the Project Proponent, to identify locations where covered reptiles may be present, evaluate current activity status in the project area, and protect the species and its habitat from avoidable construction-related disturbance. The intent of the survey is to assess current species habitat and use locations in the project area immediately prior to construction. The preconstruction survey is not intended to be a presence/ absence or protocol-level survey; the potential for species presence would have already been evaluated prior to project approval. Preconstruction surveys may be phased across a construction site if construction in different area will occur at different times; only areas where disturbance is imminent need be surveyed. The project area will be reinspected by a Qualified Biologist whenever a lapse in construction activity of 5 days or greater has occurred.

REP-2*, Environmentally Sensitive Areas and Wildlife Exclusion.* If WEF is used (see GPM-7, *Environmentally Sensitive Areas and Wildlife Exclusion* for further details), the following applies:

- For the San Francisco garter snake, WEF will be established in the uplands immediately adjacent to aquatic snake habitat (e.g., waterbodies, including ponds, wetlands, and riparian areas) and extending up to 200 feet from construction activities.
- For the giant garter snake, WEF will be installed prior to the start of ground-disturbing activities and after aquatic habitat (e.g., waterbodies, including ponds, wetlands, and riparian areas) has been dewatered (if applicable).
- For the northwestern pond turtle and southwestern pond turtle, WEF will be installed around all suitable nesting, overwintering, and/or aestivation habitat that would be disturbed within the project area.

The fencing will be inspected by a Qualified Biologist before the start of each workday and maintained by the Project Proponent until completion of the project. The fencing will be removed after all construction equipment is removed from the project site. To prevent reptiles from becoming entangled, trapped, or injured, fencing materials that include plastic or synthetic

monofilament netting will not be used. Acceptable materials include natural fibers such as jute, coconut, twine, or other similar fibers.

REP-3*, Clearing and Grubbing Vegetation.* A Qualified Biologist will be present during all vegetation clearing and grubbing activities in areas where the Covered reptiles (as identified in Table 6) are confirmed to occur, or where measures are being implemented based on presence of suitable habitat. Before vegetation removal, the Qualified Biologist will thoroughly survey the area for these species. Vegetation in sensitive areas will be cleared by handheld motorized tools (e.g., weed eaters or chainsaws) or by hand pulling, unless alternate methods are proposed by the Project Proponent and approved by USFWS. Tree stumps and roots will be left in place to avoid any ground disturbance and preserve refugia habitat, with the exception of nonnative invasive plants that could propagate from remaining vegetative material. Native branches, leaf litter, mulch, woody debris, and other vegetative trimmings may be retained and spread on site to enhance habitat as appropriate.

REP-4*, Prohibited Use of Rodenticides.* No rodenticides will be used at the project site during construction in areas that support suitable habitat for the Covered reptiles.

REP-5*, Species Observations and Encounters.* Each Proposed Restoration Project with the potential to encounter a Covered Species of reptile will submit a rescue and relocation plan to USFWS for review and approval at least 30 days before initiating construction. It is recommended that the rescue and relocation plan be provided as part of the ESA Section 7(a)(2) Review Form to reduce potential delays. General guidance to be considered during plan development is as follows: 1) leave the uninjured animal if it is not in danger; or 2) move the animal to a nearby location if it is in danger as described in *REP-6, Species Handling and Relocation*. These options are further described as follows:

- When a protected reptile is encountered in the project area, the priority is to stop all activities in the surrounding area that have the potential to result in the harm, injury, or death of the individual. The USFWS-Approved Biologist then needs to assess the situation to select the course of action that will minimize adverse effects to the individual.
- Avoid contact with the animal and allow it to move out of the project footprint and hazardous situation on its own, to a safe location. This guidance only applies to situations where an animal is encountered while moving through habitat and under conditions that will allow it to escape. This does not apply to animals that are uncovered or otherwise exposed or in areas where there is not enough adjacent habitat to support the life history of the protected reptiles if they move outside the construction footprint.
- Avoidance is the preferred option if the animal is not moving or is in some sort of burrow or other refugia. In this case, the area will be well marked for avoidance by construction equipment, and a USFWS-Approved Biologist will be assigned to the area when work is taking place nearby. If avoidance is not practicable or safe for the Covered reptile species, the Project Proponent will implement *REP6*.

REP-6*, Species Handling and Relocation.* A protected reptile will only be captured and relocated when that is the only option to prevent its death or injury, and after all attempts to

avoid interaction of the species have been exhausted, as described in *REP-5, Species Observation and Encounters.* Project-specific rescue and relocation plans will be submitted by the Project Proponent and pre-approved by USFWS. General guidance for handling and relocation is as follows:

- If appropriate habitat is immediately adjacent to the capture location, then the preferred option is short-distance relocation to that habitat. A snake will not be moved outside of the area where it could have traveled on its own. Captured snakes will be released in appropriate cover as close to their capture location as possible for their continued safety. Under no circumstances will an animal be relocated to another property without the property owner's written permission. It is the Project Proponent's responsibility to arrange for that permission.
- The release locations must be pre-identified in the Project-specific rescue and relocation plan approved by USFWS; they will depend on where the individual was found and the opportunities for nearby release. In most situations, the release location is likely to be into the mouth of a small burrow, other suitable refugia, or suitable habitat.
- Only a USFWS-Approved Biologist for the project can capture protected reptiles.

Alameda Whipsnake (Striped Racer)

AWS-1, *Habitat Avoidance and Work Window.* Ground disturbance and vegetation clearing in scrub/chaparral habitat will be avoided to the maximum extent possible. Project activities in suitable habitat in the currently occupied range of the species where Alameda whipsnake is known to be or may be present will be confined to April 1 through October 31.[7] To the extent practicable, all rock outcrops will be avoided. Not to exceed the self-imposed take limit of injury or mortality to no more than four adults or juveniles/hatchlings annually. The self-imposed take limit also requires no net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.

AWS-2, *Daily Timing Restrictions.* To avoid or minimize effects on the Alameda whipsnake and its habitat, construction and ground disturbance will occur only during daytime hours, will cease no less than 30 minutes before sunset, and may not begin again earlier than 30 minutes after sunrise. If nighttime work is needed, the Project Proponent should explain in the ESA Section 7(a)(2) Review Form why it is needed, along with any additional protection measures that may be appropriate, for review and approval by the USFWS Field Office. A Qualified Biologist will inspect the site prior to vehicle operation and will monitor construction activities.

Giant Garter Snake

The following measures will be implemented in suitable giant garter snake habitat within the current range of the species, or where the species is known or suspected to occur.

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[7] Extended or alternative work windows may be considered on an individual project basis with prior approval from USFWS ES, provided the Project Proponent can demonstrate that measures implemented to avoid or minimize exposure would do so at a level commensurate with the standard work windows.

GGS-1, *Biologists.* A USFWS-Approved Biologist will oversee construction activities in, or within, 200 feet of suitable giant garter snake aquatic or upland habitat and will direct Qualified Biologists who may also support the project. A Qualified Biologist will be present during vegetation removal in giant garter snake habitat and during construction activities adjacent to aquatic habitat. The Qualified Biologist will walk ahead of the removal of emergent wetland and herbaceous upland vegetation.

The USFWS-Approved Biologist will be available on an on-call basis during activities with the potential to affect giant garter snake. If needed, the USFWS-Approved Biologist will remain on site during construction activities to protect giant garter snake. The USFWS-Approved Biologist or any Qualified Biologist working on site will have the authority to stop work if a giant garter snake is encountered in the construction area. No snakes will be moved, relocated, or handled unless the Project Proponent has submitted a snake rescue and relocation plan to USFWS, and USFWS has reviewed and approved the plan. Project Proponents may choose to submit their snake relocation plan to USFWS with their ESA Section 7(a)(2) Review Form to expedite review and approval; or may develop the plan in coordination with USFWS after the ESA Section 7(a)(2) Review Form has been submitted, but before construction begins.

GGS-2, *Minimize Footprint.* Disturbance to suitable aquatic and upland sites in or near the proposed project footprint will be minimized, and the loss of aquatic habitat and grassland vegetation will be minimized through adjustments to proposed project design. Not to exceed the self-imposed take limit of injury or mortality to no more than four adults or juveniles/hatchlings annually. The self-imposed take limit also requires no net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.

GGS-3, *Work Window.* Project activities within 200 feet of suitable aquatic habitat within the current range of the species will be confined to May 1 through October 1.[8]

GGS-4, *Speed Limit.* Posted speed limit signs will be observed on local roads and a 15-mph speed limit will be observed within 200 feet of suitable giant garter snake habitat, unless measures have been taken to exclude giant garter snake from the work area, and confirmed by the USFWS-Approved Biologist. Drivers will stop for snakes on the roadway and wait for the snake to leave on its own or drive around, completely avoiding the snake.

GGS-5, *Minimize Clearing.* Vegetation clearing within 200 feet of suitable giant garter snake aquatic habitat will be confined to the minimal area necessary to facilitate construction activities and protect giant garter snake. Movement of heavy equipment will be confined to the construction footprint, existing roadways, and temporary construction access roads established during construction. In coordination with the USFWS-Approved Biologist, high-use areas should be cleared to reduce cover for giant garter snake, and vegetation in other areas should be protected.

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[8] Extended or alternative work windows may be considered on an individual project basis with prior approval from USFWS ES, provided the Project Proponent can demonstrate that measures implemented to avoid or minimize exposure would do so at a level commensurate with the standard work windows.

GGS-6*, Environmentally Sensitive Areas and Wildlife Exclusion.* A combination of fencing and/or monitoring will be used to protect giant garter snake and will be implemented in coordination with the USFWS-Approved Biologist. If topography and soils of the project site are suitable for fencing, prior to the start of construction and during the active period for giant garter snakes (beginning May 1), the USFWS-Approved Biologist will determine where ESAF will be installed to protect giant garter snake habitat adjacent to the proposed project footprint. WEF will be installed around the perimeter of the work area to minimize the potential for giant garter snakes to enter the construction work area. If work extends beyond October 1 (with approval from the USFWS Field Office),[18] the WEF will be regularly maintained to prevent giant garter snakes from entering the construction limits and using upland areas for overwintering (see GPM-7, *Environmentally Sensitive Areas and/or Wildlife Exclusion*). If WEF is found to be compromised, a Qualified Biologist will conduct a survey immediately preceding construction activity that occurs in designated giant garter snake habitat, or in advance of any activity that may affect other species. The Qualified Biologist will search along WEF and in pipes, culverts, and beneath equipment (e.g., vehicles or heavy equipment) before they are moved (see ASP-4*, Entrapment)*. Monitoring can be conducted in lieu of WEF at sites where installation is not practicable (see GPM-5*, Environmental Monitoring;* and GPM-7, *Environmentally Sensitive Areas and/or Wildlife Exclusion*).

GGS-7*, Minimize Impacts During Clearing.* This measure only applies to areas where there are burrows, cracks, and structures that can provide underground refugia that giant garter snakes can use. During the snake active period (May 1 through October 1), installation of erosion control BMPs, vegetation clearing in or adjacent to aquatic habitat, and the establishment of staging areas within 100 feet of aquatic habitat will occur between 11:00 a.m. and 6:00 p.m., when snakes are most likely to be above ground and active. Time restrictions are only for initial ground disturbance and BMP installation for a given area. A Qualified Biologist will be present during vegetation removal in giant garter snake habitat and during construction activities adjacent to aquatic habitat. The Qualified Biologist will walk ahead of the removal of emergent wetland and herbaceous upland vegetation. Ground disturbance will be confined to the minimal area necessary to facilitate construction activities. Movement of heavy equipment will be confined to existing or temporary interior roads. A 15-day lag time will elapse between the completion of above-ground vegetation removal and commencement of root-zone grubbing activities, to allow snakes that may be present in the immediate area to move to other more suitable habitat.

GGS-8*, Work Stoppage.* A Qualified Biologist will conduct surveys if construction activities stop for 2 weeks or more.

GGS-9*, Working in Aquatic Habitat.* For projects that would affect all, or the majority of, a large aquatic habitat feature where snakes may need to be relocated following the installation of WEF around the aquatic area and the construction footprint, any giant garter snakes observed in the construction zone will be captured and relocated by a USFWS-Approved Biologist. If a giant garter snake is observed in the dewatered area, then the USFWS-Approved Biologist will capture and release the snake following a USFWS-Approved snake relocation plan.

GGS-10*, Dewatering Activities.* Where appropriate to protect giant garter snake, aquatic habitat for the giant garter snake will be dewatered prior to ground disturbance in waterways and remain dewatered and absent of aquatic prey for 48 hours prior to the initiation of construction activities. This approach may be most appropriate where habitats to be dewatered are relatively small

compared to adjacent habitats or where the work areas will be isolated within coffer dams. If complete dewatering is not possible, the water feature will be thoroughly inspected by a Qualified Biologist prior to the commencement of construction. If snakes are found, the USFWS-Approved Biologist will proceed as indicated in the previous measures. Engineering controls will be instituted as appropriate to prevent snakes from being entrained by the suction of large pumps used in dewatering. Such controls may include installation of a wire cage to create an area of separation between the water body and the intake. A Qualified Biologist will be present during the initial dewatering activities and will periodically inspect the waterway to confirm that it remains dry and incapable of supporting aquatic giant garter snake prey. If, during project planning, complete dewatering is not anticipated to be possible or appropriate (e.g., would cause more harm than working in the wet), the Project Proponent may propose alternate measures for USFWS review and approval when submitting the ESA Section 7(a)(2) Review Form. At minimum, in the absence of dewatering, the water feature will be thoroughly inspected by a Qualified Biologist prior to the commencement of construction. If snakes are found, the USFWS-Approved Biologist will proceed as indicated in the previous measures.

GGS-11, *Snake Observation.* If a giant garter snake is observed in the construction area, all construction activities will cease, and a USFWS-Approved Biologist will be notified immediately. Once the USFWS-Approved Biologist is at the location of the snake, all construction activities within 200 feet of the snake, if within the fenced construction footprint, will remain on hold to prevent harm to the snake. The snake should be allowed to leave on its own, and activities will not resume until the snake has moved out of the construction footprint on its own. Relocation of the snake will only be allowed as a last resort and in a manner consistent with a project-specific, USFWS-Approved GGS Relocation Plan.

San Francisco Garter Snake

SFGS-1, *Speed Limit.* Observe posted speed limit signs on local roads and observe a 15-mph speed limit within 200 feet of suitable San Francisco garter snake habitat, unless measures have been taken to exclude San Francisco garter snake from the work area, and have been confirmed by the USFWS-Approved Biologist. Drivers will stop for snakes on the roadway and wait for the snake to leave on its own or drive around, completely avoiding the snake.

SFGS-2, *Work Window.* Construction activities will occur when the reptiles are more active, capable of escape, more likely to avoid danger, and less likely to be affected by the Proposed Restoration Project. Project activities in suitable habitat within the currently occupied range of the species will be confined to April 15 through October 31.[9] Project activities will not occur during rain events or within the following 24 hours. Based on temperatures and snake activity observed at the project site in October during construction monitoring, and forecast temperatures for early November, the Project Proponent may request an extended work window, until November 15, subject to the review and written (e.g., email) approval of the USFWS Field Office.

[9] Extended or alternative work windows may be considered on an individual project basis with prior approval from USFWS ES, provided the Project Proponent can demonstrate that measures implemented to avoid or minimize exposure would do so at a level commensurate with the standard work windows.

SFGS-3*, Daily Timing Restrictions.* All work activities will begin no sooner than 15 minutes after sunrise and will be completed no later than 15 minutes after sunset.

SFGS-4*, Working in or Near Aquatic Habitat.* A Qualified Biologist will be present when working in or near San Francisco garter snake habitat. If topography and soils are suitable for fencing, WEF can be used around staging and stockpiling areas. Not to exceed the self-imposed take limit of injury or mortality to no more than four adults or juveniles/hatchlings annually. No permanent loss of hibernacula.

SFGS-5*, Brush Piles.* San Francisco garter snake may seek cover in brush piles generated during construction activities. Brush piles will be removed from the project site daily or placed daily into containers inaccessible to San Francisco garter snake. If brush piles remain on site and accessible to San Francisco garter snake overnight, the brush piles will be removed by hand to avoid injuring San Francisco garter snake that may take cover within.

Western Pond Turtles (Northwestern Pond Turtle and Southwestern Pond Turtle)

WPT-1, *Habitat Avoidance.* A Qualified Biologist will survey and flag the work area for suitable overwintering habitat (e.g. leaf litter layer under trees and shrubs) or nesting habitat to avoid. Any flagging used must be removed after work is completed. Project personnel will be advised to avoid disturbance in these areas unless site-specific conservation measures allow work to be conducted in these areas to minimize or avoid disturbance.

To the extent feasible, logs or rocks will not be moved or otherwise disturbed to avoid impacts to turtles utilizing these objects as cover. If such features must be moved, the biologist will visually inspect these features prior to and during moving to ensure turtles are not present. The biologist will also ensure any work materials do not create dispersal barriers to pond turtle. If a pond turtle is found in the work area during construction, work will stop until the individual(s) leave the area on their own volition. Workers should be vigilant to avoid turtles on roadways and be made aware of the potential for hatchling dispersal. Workers must also visually check for turtles (particularly hatchlings) under vehicles and equipment prior to moving them and allow the turtles to leave the area on their own volition before moving vehicles or equipment. Vehicles should stay on designated roads where feasible and if overland travel is needed in suitable habitat where there is a possibility of dispersing hatchlings, a monitor may be required.

WPT-2, *Visual Encounter Surveys*. Before construction activities occur, a Qualified Biologist will search all suitable aquatic habitat in the project area a minimum of three times during appropriate weather conditions (e.g. sunny periods between 8am to 12pm, and from 3pm until an hour before dusk; air temperatures 55.0-90.0 degrees Fahrenheit; wind speeds less than 12.0 mph). Surveys will occur when western pond turtles are most likely to be detected in aquatic habitat:

- For the southwestern pond turtle, the highest probability of detection is from March 1 to October 31 (May 1 to August 31 at elevations above 3,500 feet). If work will occur outside of this window, a Qualified Biologist will also search upland habitat between September 1 and April 30 (September 1 to April 30 at elevations above 3,500 feet).

- For the northwestern pond turtle, the highest probability of detection is from April 1 to September 30 (May 1 to August 31 at elevations above 3,500 feet). If work will occur outside of this window, a Qualified Biologist will also search upland habitat between October 1 and March 31 (September 1 to April 30 at elevations above 3,500 feet).

In areas where western pond turtles are known to occur or could be present, follow current guidance for visual encounter surveys in the Visual Encounter Survey Protocol for Western Pond Turtles developed by the Oregon Native Turtle Working Group (ODFW 2020). If surveys are not conducted or do not follow USFWS-approved methods, assume western pond turtles are present in suitable aquatic and upland habitat. Inquire with local USFWS Field Office on western pond turtle data records and if surveys have been completed in the project area.

WPT- 3, *Work Windows*. For project areas where the northwestern pond turtle or southwestern pond turtle are known or assumed to occur, avoid work during the following windows:

- For project activities that involve in-water/dewatering work, work will be avoided from October 1 to March 31.
- For project activities within 500 meters (1604.4 feet) of suitable nesting habitat (i.e. sunny, open grasslands and ruderal habitat or bare soil), avoid disturbing nesting adult females from May 15 to July 31 for the northwestern pond turtle (except May 1 to July 31 in the San Joaquin Valley) and May 1 to July 31 for the southwestern pond turtle unless wildlife exclusion fencing has been installed around all suitable nesting habitat within the proposed project footprint prior to the start of the nesting season (i.e., prior to May 15 for the northwestern pond turtle (except prior to May 1 in the San Joaquin Valley) and prior to May 1 for the southwestern pond turtle).
- For project activities in overwintering habitat (e.g. muddy pond bottoms), work will be avoided from October 1 to March 31 (September 1 to April 30 above 3,500 feet elevation) unless wildlife exclusion fencing has been installed around all suitable overwintering habitat within the proposed project footprint prior to the start of the overwintering season (i.e., prior to October 1 at elevations < 3,500 feet and prior to September 1 at elevations >3,500 feet). Alternatively, if installation of wildlife exclusion fencing around all overwintering habitat is not feasible, then all suitable overwintering cover (e.g. leaf litter layer, woody debris) will be removed from the project footprint before overwintering begins (i.e., prior to October 1 at elevations < 3,500 feet and prior to September 1 at elevations >3,500 feet), and will be maintained daily free of suitable overwintering cover. A qualified biologist will also search all mammal burrows for overwintering western pond turtles and move them out of harm's way. The qualified biologist then may collapse the burrows to prevent their usage by overwintering western pond turtles.
- For project activities in aestivation habitat (e.g., upland habitat (e.g. leaf litter) within 500 meters (1,640.4 feet) of suitable aquatic habitat), work will be avoided when nearby seasonal aquatic habitat is dry unless wildlife exclusion fencing has been installed around

all suitable aestivation habitat within the proposed project footprint before nearby seasonal aquatic habitats dry up.

Work windows may be modified via completion of the ESA Section 7(a)(2) Review Form and local Field Office approval.

WPT-4, *Environmentally Sensitive Areas and Wildlife Exclusion.* Fencing and/or monitoring will be used to protect western pond turtles and will be implemented in coordination with a Qualified Biologist. If the project site is suitable for fencing, the USFWS requires an Exclusion Fencing Plan, and a Qualified Biologist will determine where ESAF will be installed to protect western pond turtle habitat adjacent to the proposed project footprint.

If complete exclusion of the project disturbance footprint with WEF is not feasible in the project area, projects may consider directional fencing (fencing that is meant to guide the movement of western pond turtles safely around a work area) to discourage western pond turtles from entering the project area from suitable habitat, or fencing off only portions of the larger project area as they are being actively worked on. The local USFWS Field Office may be contacted for technical assistance on excluding western pond turtles from a project area where complete exclusion fencing is not feasible.

WEF must be opaque, non-climbable material, at least 2.0 feet (0.6 meters) high, have one-way exit funnels away from the work area, and contoured such that western pond turtles are unable to climb over the fence. WEF will include coverboards spaced every 50 to 100 feet on either side to provide cover to western pond turtles that encounter the fence. If WEF is found to be compromised, a Qualified Biologist will conduct a survey immediately preceding construction activity that occurs in western pond turtle habitat, or in advance of any activity that may affect other species. The Qualified Biologist will search along WEF and in pipes, culverts, and beneath equipment (e.g., vehicles or heavy equipment) before they are moved (see ASP-4*, Entrapment)*. Monitoring can be conducted in lieu of WEF at sites where installation is not practicable (see GPM-5*, Environmental Monitoring;* and GPM-7, *Environmentally Sensitive Areas and/or Wildlife Exclusion*).

WPT-5, *Capture and Relocation.* Western pond turtles will only be captured and relocated when it is the only option to prevent injury or mortality, and after all attempts to avoid interaction with the species have been used. If necessary to avoid injury or mortality, relocation of western pond turtles will be conducted by a Qualified Biologist in accordance with the requirements of *REP-6, Species Handling and Relocation*. Western pond turtle relocation will be conducted as described in a USFWS-approved reptile relocation plan submitted by the Project Proponent to the local USFWS Field Office concurrently with the ESA Section 7(a)(2) Review Form or at least 60 days before construction. Early submission facilitates timely USFWS review and approval and helps avoid project delays.

- Avoid and minimize transfer of diseases (e.g. turtle-shell disease, respiratory disease). The Qualified Biologist will wear disposable nonlatex or rubber gloves when handling individual turtles to inhibit transmission of disease. Any suspected observations of disease such as respiratory or turtle-shell disease in western pond turtles or any other species of turtle at the project site will be reported to the USFWS within 24 hours and before relocating any western pond turtle. If any western pond turtle or other turtle species in the project site test positive or are suspected of turtle-shell disease, then all turtles at the

project site will be considered to be potentially infected. All equipment and clothing will be decontaminated and dried completely prior to and after use at an aquatic project site to prevent disease transmission between water bodies.

- Western pond turtles will be released within a few hours of capture. Individuals will be kept in containers with high sides, such as 5-gallon (18.9 liter) plastic buckets or 10-gallon (37.9 liter) storage tubs. Place a lid or piece of cloth over the top to darken the container. Keep captured western pond turtles out of direct sunlight because overheating is possible in a short time.
- The Qualified Biologist will capture and relocate the western pond turtle the shortest distance possible to a location that contains similar suitable habitat and that will not be affected by activities associated with the project. No western pond turtles will be relocated more than 500 meters or to a different watershed to prevent disorientation and the spread of diseases.
- If a western pond turtle found in upland habitat is suspected of traveling to an overwintering/aestivation or nesting site and voids its bladder upon handling, then the western pond turtle will be returned to aquatic habitat.
- Nesting or gravid female western pond turtles will be avoided to the greatest extent practicable. If an adult female western pond turtle is gravid or post-nesting, the Qualified Biologist will determine if she will be relocated to suitable undisturbed nesting habitat or suitable aquatic habitat outside of the work area. All possible precautions will be taken to allow her to continue to nest and to avoid nest failure.

Refer to the 2024 Northwestern Pond Turtle Avoidance and Minimization Measures (USFWS 2024a) and Southwestern Pond Turtle Avoidance and Minimization Measure Recommendations (USFWS 2024b) for more details on relocation of western pond turtles.

WPT-6, ***No Net Loss of Basking Habitat.*** Maintain existing basking structures (e.g. logs, rocks, shorelines, emergent vegetation, algal mats, and substrate adjacent to aquatic habitat whenever possible. Avoid planting trees and shrubs that would shade suitable basking habitat and maintain an open riparian canopy to allow sufficient solar exposure for basking. Install basking structures as necessary for any basking habitat that is removed.

WPT-7, ***Avoid Excessively Shading Nesting Habitat.*** Avoid planting trees and shrubs that would shade suitable nesting habitat if nesting habitat is limited near the project area.

Birds

There are twelve federally-listed bird species being addressed in this PBO. A list of these bird species is provided in Table 7.

General Bird Protection Measures

No General Bird Protection Measures were identified to cover all Covered birds; however, birds are grouped by species with similar habitat needs and life histories. For example, General Rail Protection Measures are provided for two rail species.

Several GPMs would reduce potential effects on all Covered bird species, if relevant activities occur on a project site. These measures include but are not limited to GPM-2, *Construction Work Windows*; GPM-3, *Construction Hours*; GPM-4, *Environmental Awareness Training*; GPM-5, *Environmental Monitoring*; GPM-7: *Environmentally Sensitive Areas and Wildlife Exclusion*; ASP-5, *Airborne Noise Reduction*; ASP-1, *Qualifications of the Qualified Biologist and USFWS-Approved Biologist*; ASP-2, *Preconstruction Surveys*; ASP-5, Airborne Noise Reduction; and VHDR-3, *Revegetation Materials and Methods*.

General Rail Protection Measures (California Clapper Rail and Light-Footed Ridgway's Rail)

The following general measures apply to the California clapper rail and light-footed Ridgway's rail and should be included in the project (via the ESA Section 7(a)(2) Review Form) if the project may affect any of these species. Additional, individual Species Protection Measures are provided for some of these species below.

RAILS-1, *Habitat Avoidance.* Disturbance to suitable habitat not required to achieve project goals will be avoided, and damage to marsh vegetation/compression of marsh substrate will be minimized by the use of weight-distributing methods (e.g., crane mats). Not to exceed the self-imposed take limits in Table 7, *Covered Species – Birds*.

RAILS-2, *Work Area Limits.* Work site boundaries in suitable habitat will be clearly marked with flagging, fencing, or other visible materials, which will be removed at the conclusion of the project.

RAILS-3, *Site Access Restrictions.* If the site conditions allow access to work sites in habitat where presence has been confirmed or is presumed will be by foot travel; otherwise, heavy equipment will be allowed in suitable nesting habitats only with the presence of a Qualified Biologist. Access routes and work areas will be limited to the minimum amount necessary to achieve the project goals.

RAILS-4, *Avoid Placement of Predator Perches.* Workers will avoid temporary or permanent placement of structures (e.g., posts, railings, tall equipment, or fence lines) that could provide elevated perches for predatory birds near or in habitat where presence has been confirmed or is presumed.

RAILS-5, *Use of Handheld Tools.* Project activity in habitat where presence has been confirmed or is presumed will be limited to the use of handheld tools, including handheld motorized implements such as chainsaws and power augers, unless these methods are not conducive to implementation in this manner, in which case other methods will be proposed in the ESA Section 7(a)(2) Review Form. Tools will be washed prior to use in these habitats, to reduce the potential for spread of nonnative plant species and their seeds. If handheld motorized tools are used, operators will employ GPMs to avoid and minimize soil and water contamination from fuel and lubricants.

RAILS-6, *Site Stabilization.* No soil stabilization materials or offsite materials (e.g., decomposed granite, soil, or rocks) will be added to the surface in occupied habitat.

Table 7: Covered Species **– Birds**
Self-Imposed Annual Take Limits and Effects Determinations

Common Name	Annual Take Limits	ESA Effects Individuals	ESA Effects Critical Habitat
California least tern	No lethal take allowed. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of a tern colony. No net loss of habitat through implementation of protection measures and/or offsetting impacts with habitat restoration or enhancement.	LAA	Not Applicable
California spotted owl – Coastal-Southern California DPS	No more than 1 pair harmed from disturbance annually.	LAA	Not Applicable
California spotted owl – Sierra Nevada DPS	No more than 1 pair harmed from disturbance annually.	LAA	Not Applicable
California Ridgway's rail	Injury or mortality of no more than 1 individual annually. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of the population in the project area. No net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.	LAA	Not Applicable
coastal California gnatcatcher	Injury or mortality of no more than 1 nest annually. Mortality to a nest would include disturbance to an active nest with egg(s) or chick(s) in the nest or if fledglings are still dependent on the nest for survival. Harm to no more than 2 individuals annually. No net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.	LAA	LAA

Common Name	Annual Take Limits	ESA Effects Individuals	ESA Effects Critical Habitat
least Bell's vireo	Injury or mortality of no more than 8 individuals and 4 nests annually. Mortality to a nest would include disturbance to an active nest with egg(s) or chick(s) in the nest or if fledglings are still dependent on the nest for survival. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of an occupied pairs' territory, except for restoration projects where the purpose is to remove non-native vegetation to improve least Bell's vireo habitat. No net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.	LAA	LAA
light-footed Ridgway's rail	Harm to no more than 5% of a given population annually. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of the population in the project area. No net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.	LAA	Not Applicable
marbled murrelet	Injury or mortality to no more than 1 nesting murrelet pair and their dependent young (1 egg/chick per annual clutch) per recovery unit annually.	LAA	LAA
northern spotted owl	No more than 18 nesting individuals harmed from disturbance annually.	LAA	LAA
southwestern willow flycatcher	Not Applicable	NLAA	NLAA

Common Name	Annual Take Limits	ESA Effects Individuals	ESA Effects Critical Habitat
western snowy plover –Pacific Coast DPS	Death or injury of no more than 2 individuals annually per recovery unit. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of occupied plover habitat.	LAA	LAA
yellow-billed cuckoo – Western DPS	Not Applicable	NLAA	NLAA

Notes:

Limits reset on January 1 each year. Limits apply to the entire range of the species (range-wide), unless otherwise indicated.

California Clapper Rail (California Ridgway's Rail)

CRR-1, *Protocol-Level Presence/Absence Survey*. Where suitable habitat may exist, USFWS-Approved Biologists qualified to perform presence/absence surveys will conduct protocol-level surveys for the California Clapper rail prior to construction, following the *June 2015 USFWS California Clapper Rail Survey Protocol* (USFWS 2015c) or the most recent version of the protocol. In lieu of conducting USFWS protocol presence/absence surveys, the Project Proponent may choose to assume presence and implement the following avoidance measures, based on the presence of suitable habitat in the current range of the species.

CRR-2, *Species Avoidance and Work Windows*. If a California Clapper rail presence is detected or assumed present[10] in the subject habitat, the following measures will be applied.[11]

a. If the proposed project is in or near a tidal marsh area, activities in or adjacent to California Clapper rail habitat will not occur within 2 hours before or after extreme high tides (6.5 feet or above measured at the Golden Gate Bridge and adjusted to the timing of local high tides) which could prevent California Clapper rails from reaching available cover. Current and predicted tides and currents measured at the Golden Gate Bridge can

[10] The Project Proponent will assume a species is present in an area when suitable habitat is present within the current range of the species and their absence has not been determined by a negative finding using protocol level surveys.

[11] Extended or alternative work windows may be considered on an individual project basis with prior approval from USFWS ES, provided the Project Proponent can demonstrate that measures implemented to avoid or minimize exposure would do so at a level commensurate with the standard work windows.

be accessed via the NOAA website at https://tidesandcurrents.noaa.gov/noaatidepredictions.html?id=9414290&legacy=1.

To minimize or avoid the loss of individual California Clapper rails, activities in or adjacent to tidal marsh areas will be avoided during the California Clapper rail breeding season from February 1 through August 31 each year, including by implementing a noise buffer distance of 1,000 feet in occupied or assumed occupied California Clapper rail habitat. Noise buffer distances may be modified in coordination with the USFWS Field Office based on project specific characteristics or a Project Proponent/Action Agency may choose to submit their own analysis and buffer recommendations for USFWS's consideration. If sufficient buffers cannot be implemented, the proposed activities may lead to adverse effects, including possible incidental take up to the program limit for this species (Table 8).

To minimize or avoid adverse effects to California Clapper rails outside of breeding season (from September 1 through January 31), a noise disturbance buffer of 500 feet will be maintained between noise-generating project activities and occupied or assumed occupied California Clapper rail habitat. Noise buffer distances may be modified in coordination with the USFWS Field Office based on project specific characteristics or a Project Proponent/Action Agency may choose to submit their own analysis and buffer recommendations for USFWS's consideration. If sufficient buffers cannot be implemented, the proposed activities may lead to adverse effects, including possible incidental take up to the program limit for this species (Table 8).

Before beginning work in habitat where a species is present or assumed present,[14] the following must occur:

i. If more than one day has lapsed following ASP-2 Preconstruction Surveys or if vegetative cover has not already been removed, then the Qualified Biologist will survey the work area for presence of California Clapper rails.
ii. If rails are encountered, activities will be halted until the individual has left the area on its own.

Not to exceed the self-imposed take limit of injury or mortality of no more than 1 individual annually. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of the population in the project area. The self-imposed take limit also requires no net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.

Light-Footed Ridgway's Rail

LFRR-1, *Habitat Assessment*. A habitat assessment will be conducted by a Qualified Biologist to determine whether the project area contains suitable habitat (including foraging, nesting, and dispersal habitat) for the rail. If suitable habitat for this species is identified and the proposed project may affect suitable habitat, the Project Proponent will implement measures LFRR-1,

LFRR-2, and RAILS-1 through RAILS-6 in areas with suitable habitat. Alternatively, the Project Proponent may propose to conduct surveys to confirm the presence or absence of the species.

LFRR-2*, Work Window*. To avoid the nesting season of the light-footed Ridgway's rail, project activity in habitat where presence has been confirmed, or is presumed, will be conducted from September 16 through March 14. If project activities must occur during the nesting season, individuals, nests, and occupied or assumed occupied habitat will be avoided by implementing a 500-feet disturbance buffer between noise-generating project activities and light-footed Ridgway's rail habitat Noise buffer distances may be modified in coordination with the USFWS Field Office based on project specific characteristics or a Project Proponent/Action Agency may choose to submit their own analysis and buffer recommendations for the USFWS' consideration. If sufficient buffers cannot be implemented, the proposed activities may lead to adverse effects not to exceed the self-imposed take limit of harm to no more than 5% of a given population annually. The self-imposed take limit also requires no net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of the population in the project area.

California Least Tern

CLT-1*, Habitat Avoidance.* Habitat occupied by California least tern will be avoided to the maximum extent possible.

CLT-2*, Work Windows.* To avoid potential effects on nesting California least tern, project activity in suitable or known nesting habitat where presence has been confirmed or is presumed will occur during the species' nonbreeding season. If breeding season avoidance is not possible, additional monitoring and avoidance measures will be proposed in the ESA Section 7(a)(2) Review Form, for review and approval by the USFWS Field Office:

- For the California least tern, project activities will be confined to October 1 through February 28 (or through February 29 in a leap year), when north of the Monterey/San Luis Obispo county line; and September 16 through March 31, when south of the Monterey/San Luis Obispo county line. [12]

If project construction activities occur adjacent to but not in suitable nesting habitat, project activities will be conducted during the species' nonbreeding seasons. If nonbreeding season construction is not possible, the Project Proponent will employ a USFWS-Approved Biologist to conduct weekly surveys for California least terns.

CLT-3*, Encounters with Species.* If California least terns are observed, the USFWS-Approved Biologist or Project Proponent will notify the USFWS within 1 day of the observation, and a

[12] Extended or alternative work windows may be considered on an individual project basis with prior approval from USFWS ES, provided the Project Proponent can demonstrate that measures implemented to avoid or minimize exposure would do so at a level commensurate with the standard work windows.

Qualified Biologist will monitor all construction activities conducted adjacent to suitable nesting habitat. In addition, if project activities must occur during the nesting season, the Project Proponent will implement an 800-foot disturbance buffer between noise-generating project activities and occupied or assumed occupied California least tern habitat. Noise buffer distances may be modified in coordination with the USFWS Field Office based on project specific characteristics or a Project Proponent/Action Agency may choose to submit their own analysis and buffer recommendations for USFWS consideration. If sufficient buffers cannot be implemented, the proposed activities may lead to adverse effects, not to exceed the self-imposed take limit of no lethal take. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of a tern colony. No net loss of habitat through implementation of protection measures and/or offsetting impacts with habitat restoration or enhancement.

CLT-4*, Work Area Limits.* When necessary to minimize the area affected by the project, work site boundaries will be marked with flagging or other visible materials, which will be removed at the conclusion of the project.

CLT-5*, Site Restrictions.* The following measures will apply in suitable nesting habitat for the California least tern:

a. Access to work sites will be by foot travel only. If motorized vehicles, including all-terrain vehicles, are needed at the work sites in suitable nesting habitat, a Qualified Biologist must be onsite.

b. Vehicles, including all-terrain vehicles, used for transport of personnel will be restricted to existing parking lots or roadside parking areas.

CLT-6*, Avoid Placement of Predator Perches.* Workers will avoid temporary or permanent placement of structures (e.g., posts, railings, tall equipment, or fence lines) that could provide elevated perches for predatory birds near or in habitat where presence has been confirmed or is presumed.

CLT-7*, Use of Handheld Tools and Heavy Equipment.* Nonbreeding season project activity in habitat where presence has been confirmed or is presumed will be limited to the use of handheld tools, including handheld motorized implements such as chain saws and power augers, to the extent practicable. Tools will be washed prior to use in these habitats, to reduce the potential for spread of nonnative and invasive plant species and their seeds. No heavy equipment will be allowed in suitable nesting habitats without the presence of a Qualified Biologist. If handheld motorized tools and/or heavy equipment are used, operators will employ GPMs as appropriate, such as GPM-10, WQHM-1, and WQHM-4 to avoid and minimize soil and water contamination from fuel and lubricants.

Western Snowy Plover (Pacific Coast DPS)

The following measures are those the USFWS considers to be consistent with a not likely to adversely affect (NLAA) determination for the western snowy plover (plover). If modified measures are proposed, the proposed activities may lead to adverse effects, not to exceed the self-imposed take limit of death or injury of no more than two individuals annually per recovery unit. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of occupied plover habitat.

WSP-1, Habitat Avoidance. Habitat occupied by western snowy plover will be avoided to the maximum extent possible.

WSP-2, Work Windows. To avoid adverse effects to nesting plovers and dependent young, proposed work in project Action Areas that include suitable plover habitat should occur during the plover's nonbreeding season (i.e., between 1 October and 28/29 February). If work during the breeding season (i.e., between March 1 and September 30) is required, additional monitoring and avoidance measures shall be followed (see measure WSP-5).

WSP-3, Environmental Awareness Training. Pre-construction environmental awareness training will be conducted by a USFWS-Approved Biologist for all project workers prior to the initiation of work in occupied suitable habitat. The training will include a physical description of plovers, plover nesting habitat, environmental laws, permit requirements, and, most importantly, proper application of these conservation measures. This training will not be required if the Action Agency does not detect plovers during pre-work surveys (described in WSP-3 and WSP-4 below). However, the training may still be required by the USFWS if the Action Agency does not detect plovers on a beach that traditionally has been occupied by plovers either year-round or seasonally (i.e., wintering only or breeding only).

WSP-4*, Nonbreeding "Wintering" Season Measures.* To determine whether plovers are wintering within the Action Area a plover survey will be conducted by a USFWS-Approved Biologist within all suitable habitat in the Action Area one week prior to proposed work activities. If no plovers are detected, work may proceed without restrictions. Surveys shall be conducted weekly thereafter, and work may proceed without restrictions if plovers are not detected. If one or more plovers are detected during a weekly survey, daily pre-activity plover surveys will be started. If no plovers are detected during a daily pre-work survey, work may proceed without restrictions during that day. If plovers are detected, work will stop immediately and not begin again until a USFWS-Approved Biologist has determined that the plovers have vacated the Action Area. If no plovers are detected for 7 consecutive days, daily surveys will be replaced by weekly surveys until plovers are detected again.

WSP-5*, Breeding Season Measures.* To determine whether plovers are occupying the Action Area during the breeding season, a plover survey will be conducted by a USFWS-Approved Biologist within all suitable habitat within the one week prior to proposed work activities. If no plovers are detected, work may proceed without restrictions, but weekly surveys shall continue

throughout the breeding season. If one or more plovers are detected within the Action Area during any weekly survey, the following measures shall be adhered to:

a. Daily pre-activity plover surveys by a USFWS-Approved Biologist will be conducted in all suitable habitat. The USFWS-Approved Biologist will also remain on site during all work activities occurring within suitable plover habitat. If the USFWS-Approved Biologist determines that operations are resulting in a behavioral disturbance to existing plovers, or if one or more plovers move into the after work has commenced, work will stop immediately and not begin again until the USFWS-Approved Biologist has confirmed that the plovers have vacated the area.

   If an active plover nest is found within the Action Area, the USFWS-Approved Biologist shall place an 800-foot virtual construction-avoidance buffer zone around the nest, or some other size buffer mutually agreed to in consultation with the USFWS. A Project Proponent/Action Agency may choose to submit in their ESA Section 7(a)(2) Review Form their own analysis and buffer recommendations for consideration. The buffer zone will be delineated digitally (i.e., with no physical fencing or other physical demarcation) to avoid attracting attention to the nest. Work activities shall avoid nest site buffer zones until the USFWS-Approved Biologist determines that the young have fledged, or nesting activity has ceased (e.g., nest failure, predation of chicks). If modified measures are proposed due to site-specific constraints, the proposed activities may lead to adverse effects, including possible incidental take not to exceed the self-imposed take limit of death or injury of two individuals annually per recovery unit. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of occupied plover habitat.

b. Active nests found within the Action Area shall be monitored by the USFWS-Approved Biologist from a safe distance (i.e., far enough from nest to avoid disturbing adults or chicks) at least once per day to determine whether birds are exhibiting signs of stress (e.g., frequent flushing, failure to brood eggs or chicks) possibly due to work activities. Work activities that might, in the opinion of the USFWS-Approved Biologist, disturb nesting activities (e.g., excessive noise or visual disturbance) shall be prohibited within the buffer zone until such a determination is made.

c. Access to work sites within occupied nesting habitat will be by foot travel only, and workers will approach the nesting habitat directly from the wave slope (i.e., sand wetted by the last tidal cycle) using the shortest route possible, thereby minimizing visual disturbance to breeding plovers and dependent young. If a project requires vehicle or heavy equipment (e.g., excavators, bulldozers) use above the wave slope on any plover occupied beach, the vehicles or heavy equipment will only access the beach during daylight hours, and be limited to 5 mph or the minimal speed required to prevent becoming stuck in the sand, but never to exceed a speed of 15 mph. The USFWS-Approved Biologist will walk in front of the moving vehicle or heavy equipment (at a

safe distance) to ensure that no plovers are adversely affected. A short-term behavioral disturbance such as flushing would likely not result in an adverse effect to snowy plovers, however, repeated behavioral disturbances to the same birds may result in an adverse effect. Therefore, the USFWS-Approved Biologist should work to avoid or minimize repeat exposure to any given plover, to the extent practicable.

d. No night work (using artificial sources of lighting) may occur within occupied nesting habitat.

WSP-*6, Predator Avoidance.* Workers will avoid temporary or permanent placement of structures (e.g., posts, railings, tall equipment, or fence lines) that could provide elevated perches for predatory birds near or in occupied habitat. Trash and food will be contained in predator-proof containers and transported off site each day to avoid attracting plover predators to occupied nesting habitat. Project personnel shall not bring pets (i.e., dogs) to the construction site.

Coastal California Gnatcatcher

CAGN-1, *Habitat Assessment.* A habitat assessment will be conducted by a Qualified Biologist to determine whether suitable habitat (including foraging, nesting, and dispersal) for the gnatcatcher occurs in or adjacent to the project area. If suitable habitat for this species is identified in or adjacent to the project area and the proposed project may affect suitable habitat that is not known to be occupied by the gnatcatcher, the appropriate USFWS Office will be contacted regarding the need for surveys according to the USFWS protocol (USFWS 1997); and those surveys will be conducted, as appropriate. Alternatively, the Project Proponent may choose to implement the following avoidance measures for these species, based on the presence of suitable habitat, without conducting protocol surveys to confirm presence or absence.

CAGN-2*, Habitat Avoidance.* Project impacts will be avoided or minimized in coastal sage scrub, alluvial fan scrub, and other vegetation communities suitable for this species. If the Project Proponent made a determination that the habitat is occupied or that impacts to these habitats cannot be avoided, effects to gnatcatcher individuals will be avoided or minimized through implementation of the measures listed below.

CAGN-3*, Work Window.* To minimize effects to nesting gnatcatchers, all clearing of vegetation in occupied or identified gnatcatcher suitable habitat will occur outside the breeding season (February 15 through August 30). If the breeding season cannot be avoided, a USFWS-Approved Biologist will conduct preconstruction nesting bird surveys prior to vegetation removal. If no active gnatcatcher nests are found within a 300-foot disturbance buffer distance between noise-generating project activities and gnatcatcher nests, project activities may proceed. Noise buffer distances may be modified in coordination with the USFWS Field Office based on project specific characteristics or a Project Proponent/Action Agency may choose to submit their own analysis and buffer recommendations for USFWS consideration. If sufficient buffers cannot be implemented, the proposed activities may lead to adverse effects, not to exceed the self-imposed take limit of injury or mortality up to one nest annually and harm to no more than two individual coastal California gnatcatchers annually. Mortality to a nest would include disturbance to an

active nest with egg(s) or chick(s) in the nest or if fledglings are still dependent on the nest for survival. The self-imposed take limit also requires no net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.

CAGN-4*, Work Restrictions Near Active Nests.* If an active gnatcatcher nest is detected during the survey, either work will be suspended until the young have fledged/beginning of the nonbreeding season, or the following conditions will apply:

a. A USFWS-Approved Biologist will establish a 300-foot disturbance buffer distance between noise-generating project activities and gnatcatcher nests. Noise buffer distances may be modified in coordination with the USFWS Field Office based on project specific characteristics or a Project Proponent/Action Agency may choose to submit their own analysis and buffer recommendations for USFWS's consideration. If sufficient buffers cannot be implemented, the proposed activities may lead to adverse effects, including possible incidental take up to the program limit for this species (Table 8).

b. If a buffer is established, a Qualified Biologist will monitor the nest during construction for signs of adverse effects, including distress/disturbance. If adverse effects are detected, the Qualified Biologist will have the authority to stop all construction activities in the vicinity of the nest and implement additional protection or avoidance measures. Additionally, the USFWS-Approved Biologist will coordinate with the USFWS-Carlsbad Office to determine whether additional protection measures should be used to avoid or minimize effects on the nesting birds.

c. A Qualified Biologist will continue to monitor the nest and will determine when young have fledged (in coordination with a USFWS-Approved Biologist). Once the USFWS-Approved Biologist has confirmed that the young have left the nest, the buffer and exclusion zone may be removed, and construction activities within these areas may resume.

Marbled Murrelet

The following measures are those the USFWS considers most likely to be consistent with a not likely to adversely affect (NLAA) determination for the marbled murrelet. If modified measures are proposed, the proposed activities may lead to adverse effects, not to exceed the self-imposed take limit of injury or mortality to one nesting murrelet pair and their dependent young (one egg/chick per annual clutch) per recovery unit (Table 8).

MAMU-1*, Work Restrictions in Occupied Habitat*. If marbled murrelet surveys (using the 2003 USFWS survey protocol or the most updated version of this guidance document; Evans Mack et al. 2003) determine that the project area is occupied, or if USFWS presumes marbled murrelet occupancy without conducting surveys, the Project Proponent will adhere to the following Protection Measures. Surveyors are required to meet or exceed all training recommendations in Evans Mack et al. (2003) or the most updated version of this guideline document.

a. Vegetation Removal or Alteration of Known or Potential Nest Trees:

i. No potential marbled murrelet nest trees will be removed during any time of year. Potential habitat defined as: 1) mature (with or without an old-growth component) and old-growth coniferous forests; and 2) younger coniferous forests that have platforms (relatively flat, at least 4 inches in diameter, and at least 33 feet above the base of the live crown of a coniferous tree). Platform presence is more important than tree size.

ii. Removal or damage of known or potential nest trees will be avoided. Project Proponents should seek technical assistance from the USFWS for known or potential nesting trees determined to be a "hazard tree," or otherwise identified for possible removal to implement the project. For sites that have not been surveyed according to 2003 survey protocol, potential habitat is defined as: 1) mature (with or without an old-growth component) and old growth coniferous forests; and 2) younger coniferous forest that have platforms.

iii. Removal or damage of trees with potential nesting platforms will be avoided. A platform is a relatively flat surface at least 10 centimeters (4 inches) in diameter and 10 meters (33 feet) high in the live crown of a coniferous tree. Platforms can be created by a wide bare branch; moss or lichen covering a branch; mistletoe, witches brooms, or other deformities; or structures such as squirrel nests.

iv. Project activities will not alter suitable nesting habitat to the extent that it is no longer functioning.

v. Trimming or pruning of unsuitable nest trees or limbs, trimming or removal of brush, and felling of hazard trees in suitable habitat may occur outside of the nesting season.

b. Auditory, Visual, or Other Disturbance:

i. No proposed activity generating sound levels 20 or more decibels above ambient sound levels, or with maximum sound levels (ambient sound levels plus activity-generated sound levels) above 90 decibels (excluding vehicle back-up alarms), may occur in confirmed marbled murrelet nesting habitat during the majority of the murrelet nesting season (i.e., March 24 through August 5) (USFWS 2020a).

ii. Between August 6 (date when most murrelets have fledged in coastal northern California) and September 15 (end of murrelet nesting season) of any year, project activities, with adjacent suitable nesting habitat, that will generate sound levels ≥10 dB above ambient sound levels will observe a daily work window beginning 2 hours post-sunrise and ending 2 hours pre-sunset. However, prep work that does not generate sound levels above ambient sound levels, including street sweeping and manual removal of pavement markers, can occur during all hours. The need for this daily work window depends on the distance between suitable nesting habitat and the above-ambient sound generating activity following USFWS's guidelines (USFWS

2020a). For example, if above-ambient sound levels generated by proposed activities will become attenuated back down to ambient sound levels prior to reaching suitable nesting habitat, the daily work window would not be necessary

iii. The sound level restrictions mentioned above will be lifted after September 15; after which USFWS considers the above-ambient sound levels as having "no effect" on nesting murrelets or dependent young.

iv. No human activities shall occur within visual line-of-sight of 100 meters or less from a known nest location within the Action Area (USFWS 2020a), or from un-surveyed suitable nesting habitat containing potential murrelet nest trees within 100 meters of proposed activities.

v. Not to exceed the self-imposed take limit of injury or mortality to no more than one nesting murrelet pair and their dependent young (one egg/chick per annual clutch) per recovery unit.

MAMU-2*, Work Restrictions in Unoccupied Habitat*. If recent protocol surveys determine that all suitable marbled murrelet nesting habitat in the project area is considered unoccupied, the auditory, visual, and other disturbance measures listed in MAMU-1, do not apply. However, if marbled murrelet surveys (using the 2003 USFWS survey protocol or the most updated version of this guideline document; Evans Mack et al. 2003) determine that the project area is occupied, or if the Project Proponent presumes marbled murrelet occupancy without conducting surveys, the Project Proponent will adhere to the measures identified in *MAMU-1, Work Restrictions in Occupied Habitat*.

MAMU-3*, Work Restrictions in Marbled Murrelet Critical Habitat*. If a proposed project would result in modification to designated critical habitat for marbled murrelet, the Project Proponent will notify the FWS when submitting the ESA Section 7(a)(2) Review Form.

Northern Spotted Owl

NSO-1*, Inquire with USFWS on Northern Spotted Owl Data Records*. If the proposed project is in suitable nesting, roosting, or foraging (NRF) habitat for the northern spotted owl and may affect the northern spotted owl or its habitat, the Project Proponent will contact USFWS to obtain contact information for local USFS, County, or other biologists who can provide a northern spotted owl survey, Activity Center, and habitat suitability data for the project area. An Activity Center represents the "best of detections" such as a nest tree, an area used by roosting pairs or territorial singles, or an area of concentrated nighttime detections. This step will provide baseline information for the project area and will help determine if and where surveys will be done, or if recent surveys have been completed.

NSO-2*, Protocol Level Surveys*. If northern spotted owl surveys have not been done or are not current in accordance with the 2012 Northern Spotted Owl Survey Protocol guidance (depending on activity), and surveys are planned, conduct surveys according to the 2012 Northern Spotted Owl Survey Protocol and 2019 guidelines revision and follow the seasonal restrictions described

below for "Surveyed Landscape" (USFWS 2012c; USFWS 2019a). If surveys are not planned, assume occupancy by nesting owls based on the presence of suitable NRF habitat; adhere to the guidance and seasonal restrictions described below for operating in an "Unsurveyed Landscape."

a. As an alternative to the full six-visit protocol surveys described in the 2012 Northern Spotted Owl Survey Protocol (USFWS 2012c), three surveys can be conducted in the year of action implementation if there have been two consecutive years of surveys with six visits per year in the immediately previous years. If no northern spotted owls are detected within 0.25 mile of the proposed activities, activities may proceed that year without seasonal restrictions (see ASP-5, Airborne Noise Reduction).

NSO-3*, Habitat Avoidance.* In all suitable NRF habitat:

i. Removal or damage of known nest trees and associated screen trees will be avoided, unless they must be removed to implement the proposed project or are a confirmed safety hazard according to the guidance documents from the implementing agency or another agency with jurisdiction in the project area.

ii. Removal or damage of trees or snags with potential nesting platforms and associated screen trees will be avoided. These include trees with large, flattened tops; large, broken-topped trees; trees with decadence, such as large cavities; mistletoe broom structures, catfaces, or large limbs; or large snags with these similar characteristics.

iii. Removal of large (20 inches in diameter at breast height or larger) snags will be avoided, unless they must be removed to implement the proposed project or are a confirmed safety hazard according to the implementing agency's guidance documents.

NSO-4*, Avoid Reducing Habitat Quality.* Project activities will not result in net loss of habitat or downgrade or remove the function of suitable NRF habitat to the degree that the habitat does not function in the capacity that existed prior to treatment:

a. Although habitat elements such as individual large trees or snags may be removed from NRF habitat, the treatment must not be so extensive as to downgrade or remove the overall function of the habitat.

NSO-5*, Avoid Foraging Habitat.* In suitable foraging habitat in northern spotted owl core areas (a 0.5-mile radius or 500-acre area around an Activity Center) and in suitable foraging habitat in northern spotted owl home ranges (a 1.3-mile radius, including core, or a 3,398-acre area around an Activity Center):

a. Downgrading or removal of suitable foraging habitat function will be avoided.

b. Although habitat elements—such as individual trees, shrubs, down logs, and snags—may be removed from foraging habitat, the treatment must not be so extensive as to downgrade or remove the overall function of the habitat in a northern spotted owl core or home range below the recommended habitat levels for supporting survival, reproduction, and

occupancy (USFWS 2011a). In the interior California Klamath and California Cascades Provinces, this level is a combination of 400 acres of suitable NRF habitat in the core. For the home range, the level is 40% suitable NRF (approximately 1,336 acres). In the Redwood zone, the recommended level is 100 acres of suitable NRF habitat in the core and 500 acres of suitable NRF habitat in the home range (FWS 2019a).

NSO-6*, Work Restrictions in Previously Surveyed Landscape.* If surveys are completed or are current for the project area (based on surveys conducted by the Project Proponent, or other data provided from other agencies):

a. Do not conduct activities that result in loud or continuous noise above ambient levels within 0.25 mile (or 1,320 feet) **of a nest site** between February 1 and July 9 (see ASP-5, Airborne Noise Reduction).

   This includes activities that generate sound levels 20 or more decibels above ambient sound levels, or activities that generate maximum sound levels above 90 decibels, excluding vehicle back-up alarms. Maximum sound levels are the combined ambient and activity-generated sound levels.

b. Do not conduct any suitable habitat modification or smoke-generating activities within 0.25 mile (or 1,320 feet) **of a nest site** between February 1 and September 15.

   Suitable habitat includes northern spotted owl NRF habitat. Modification includes cutting and removal of large trees, down logs, or snags. Tree or limb trimming or pruning, brush trimming or removal, and hazard tree felling may occur as long as the noise levels described above are not exceeded during the critical breeding period of February 1 through July 9. [13]

NSO-7*, Work Restrictions in Unsurveyed Landscape.* If surveys have not been completed and cannot be done, assume occupancy by nesting owls in the project area/portion of it based on the presence of suitable NRF habitat:

a. Do not conduct activities that result in loud and continuous noise above ambient levels within 0.25-mile (or 1,320 feet) **of unsurveyed suitable NRF habitat** between February 1 and July 9 (see ASP-5, Airborne Noise Reduction).

   This includes activities that generate sound levels 20 or more decibels above ambient sound levels or activities that generate maximum sound levels above 90 decibels, excluding vehicle back-up alarms. Maximum sound levels are the combined ambient and activity-generated sound levels.

[13] Not to exceed the self-imposed take limit of no more than 18 nesting individuals harmed from disturbance per year.

b. Do not conduct any suitable habitat modification or smoke-generating activities within 0.25 mile (or 1,320 feet) **of unsurveyed suitable NRF habitat** between February 1 and September 15.

   Suitable habitat includes northern spotted owl NRF habitat. Modification includes cutting and removal of large trees, down logs or snags. Tree or limb trimming or pruning, brush trimming or removal, and hazard tree felling may occur as long as the noise levels described above are not exceeded during the critical breeding period of February 1 through July 9.[14]

NSO-8*, Work Restrictions in Designated Critical Habitat.* When working in designated critical habitat, adhere to all measures described in NSO-5, NSO-6, and NSO-7 for reducing impacts in suitable NRF habitat. This will ensure that effects to physical and biological features related to NRF (as defined under the Revised Critical Habitat final rule 77 Federal Register 71876, USFWS 2012d) are minimized.[16]

California Spotted Owl (Coastal-Southern California DPS and Sierra Nevada DPS)

CSO-1*, Inquire with USFWS on California Spotted Owl Data Records.* If the proposed project is in suitable nesting, roosting, or foraging (NRF) habitat for the California spotted owl and may affect the California spotted owl or its habitat, the Project Proponent will contact USFWS to obtain available information about California spotted owl surveys, activity centers, and habitat suitability data for the project area. An activity center represents the "best of detections" such as a nest tree, an area used by roosting pairs or territorial singles, or an area of concentrated nighttime detections. This step will provide baseline information for the project area and will help determine if and where surveys will be done, or if recent surveys have been completed.

CSO-2*, Protocol Level Surveys.* A Qualified Biologist will conduct protocol-level surveys. In areas where barred owls are believed to be absent, use the Forest Service Protocol for Surveying Spotted Owls (Forest Service 1993). In areas where barred owls are known to occur or could be present, use the 2012 Northern Spotted Owl Survey Protocol (USFWS 2012). If surveys are not conducted or do not follow USFWS-approved methods, assume California spotted owls are present in suitable nesting/roosting and foraging habitat.

If surveys are not planned, assume occupancy by nesting owls based on the presence of suitable NRF habitat; adhere to the guidance and seasonal restrictions described below for operating in an "unsurveyed landscape."

b. As an alternative to the full six-visit protocol surveys described in the 2012 Northern Spotted Owl Survey Protocol (USFWS 2012) and the 1993 Forest Service Protocol for Surveying Spotted Owls (Forest Service 1993), three surveys can be conducted in the construction year if there have been two consecutive years of protocol surveys in the

[14] Not to exceed the self-imposed take limit of no more than 18 nesting individuals harmed from disturbance per year.

immediately previous years. If no California spotted owls are detected within 0.25 mile of the proposed activities, activities may proceed that year without seasonal restrictions (see ASP-5, Airborne Noise Reduction).

CSO-3*, Habitat Avoidance.* In all suitable NRF habitat:

iv. Activities with mechanical equipment within 10-acre nest stands will be avoided.

v. Removal or damage of known nest trees and associated screen trees will be avoided.

vi. Removal or damage of trees or snags with potential nesting platforms and associated screen trees will be avoided, unless they must be removed to implement the proposed project or are a confirmed safety hazard according to the guidance documents from the implementing agency or another agency with jurisdiction in the project area. These include trees with large, flattened tops; large, broken-topped trees; trees with decadence, such as large cavities; mistletoe broom structures, catfaces, or large limbs; or large snags with these similar characteristics.

vii. Removal of large (20 inches in diameter at breast height or larger) snags will be avoided, unless they must be removed to implement the proposed project or are a confirmed safety hazard according to the implementing agency's guidance documents.

CSO-4*, Avoid Reducing Nesting and Roosting Habitat Quality.* Project activities will not result in net loss of habitat or downgrade or remove the function of suitable nesting or roosting habitat to the degree that the habitat does not function in the capacity that existed prior to treatment.

Although habitat elements such as individual large trees or snags may be removed from nesting or roosting habitat, the treatment must not be so extensive as to downgrade or remove the overall function of the habitat.

CSO-5*, Avoid Reducing Foraging Habitat Quality.* In suitable foraging habitat in California spotted owl protected activity centers (PAC) (300-acre area around an activity center) and in suitable foraging habitat in California spotted owl territory (800-acre area in the Southern Sierras and 1,000-acre area for the Northern Sierras):

c. Downgrading or removal of suitable foraging habitat function will be avoided in PACs.

d. Although habitat elements—such as individual trees, shrubs, down logs, and snags—may be removed from foraging habitat, do not remove or downgrade so much that the overall function of the habitat in a California spotted owl territory is below the recommended habitat levels for supporting survival, reproduction, and occupancy.

CSO-6*, Work Window to Avoid Impacts from Noise and Smoke.* Do not conduct activities that result in loud or continuous noise above ambient levels or smoke-generating activities within

0.25 mile (or 1,320 feet) of a nest site, PAC or unsurveyed nesting or roosting habitat between March 1 and July 9 (see ASP-5, Airborne Noise Reduction).

This includes activities that generate sound levels 20 or more decibels above ambient sound levels, or activities that generate maximum sound levels above 90 decibels, excluding vehicle back-up alarms. Maximum sound levels are the combined ambient and activity-generated sound levels.

CSO- 7, *Work Window to Avoid Impacts from Habitat Modification.* Do not conduct any suitable habitat modification within 0.25 mile (or 1,320 feet) of a nest site, PAC, or unsurveyed nesting or roosting habitat between March 1 and August 31.

Least Bell's Vireo

LBV-1, *Habitat Assessment.* A habitat assessment will be conducted by a Qualified Biologist to determine whether the project area contains suitable habitat (including foraging, nesting, and dispersal) for the least Bell's vireo. If suitable habitat for these species is identified in the project area and the proposed project may affect suitable habitat that is not known to be occupied by the least Bell's vireo, the appropriate USFWS Field Office will be contacted for technical assistance prior to submitting an ESA Section 7(a)(2) Review Form regarding the need for surveys according to USFWS protocols (USFWS 2001); and those surveys will be conducted, as appropriate. Alternatively, the Project Proponent may choose to implement the following avoidance measures for these species, based on the presence of suitable habitat, without conducting protocol surveys to confirm presence or absence.

LBV-2, *Habitat Avoidance.* Staging and temporary construction areas will be outside of suitable habitat and will use existing roads and developed areas to the maximum extent practicable. All mature riparian vegetation (e.g., willows and cottonwoods) greater than 30 feet in height will be avoided. If mature riparian vegetation cannot be avoided, it will be either transplanted elsewhere in or near the project area or placed horizontally or diagonally outside the project footprint, under the direction of a Qualified Biologist. Not to exceed the self-imposed take limit in Table 8, *Covered Species – Birds*.

LBV-3, *Work Window.* To minimize effects to nesting least Bell's vireos, all clearing of vegetation in occupied habitat or potential suitable habitat will occur outside the breeding season (September 16 through March 14). If the breeding season cannot be avoided, a USFWS-Approved Biologist will conduct preconstruction nesting bird surveys at least 48 hours before and no more than 1 week prior to vegetation removal. If no active nests are found in the project area, project activities may proceed.

LBV-4, *Work Restrictions Near Active Nests.* If an active nest is detected during the survey, either work will be suspended until the young have fledged/beginning of the nonbreeding season or the following will apply:

- An exclusionary buffer of 500 feet will be established around the nest and will be maintained between noise-generating project activities and nest's location. Noise buffer distances may be modified in coordination with the USFWS Field Office based on

project specific characteristics or a Project Proponent/Action Agency may choose to submit their own analysis and buffer recommendations for USFWS's consideration. If sufficient buffers cannot be implemented, the proposed activities may lead to adverse effects, not to exceed the self-imposed take limit of injury or mortality of up to eight individuals and four nests annually. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of an occupied pairs' territory. The self-imposed take limit also requires no net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.

- A Qualified Biologist will monitor the nest during construction for signs of adverse effects, including distress/disturbance. If adverse effects are detected, then the Qualified Biologist will have the authority to stop all construction activity near the nest. The USFWS-Approved Biologist will identify additional measures to protect the nest and will coordinate with the applicable USFWS Office regarding additional protection measures to avoid or minimize effects on the nesting birds. Construction may resume only with approval from USFWS-Approved Biologist; AND
- The Qualified Biologist, in coordination with the USFWS-Approved Biologist, will continue to monitor the nest and will determine when young have fledged. Once the USFWS-Approved Biologist has confirmed that the young have left the nest, the buffer and exclusion zone may be removed and construction activities in these areas may resume. OR
- If construction must occur in the buffer and exclusion zones, the appropriate USFWS Field Office will be contacted to determine what additional measures may be necessary to avoid and/or minimize effects to these species.

Southwestern Willow Flycatcher and Yellow-Billed Cuckoo (Western US DPS)

SWWF-YBC-1, *Habitat Assessment.* A habitat assessment will be conducted by a Qualified Biologist to determine whether suitable habitat (including foraging, nesting, and dispersal) for the flycatcher or cuckoo occurs in the Action Area. If suitable habitat for these species is identified in the Action Area and the proposed project may affect suitable habitat that is not known to be occupied, the respective USFWS Field Office/S7 Delegated Authority Program will be contacted regarding the need for surveys according to USFWS protocol (USFWS 2001; Sogge et al. 2010; and Halterman et al. 2015) and those surveys will be conducted, as appropriate. Otherwise, if the respective USFWS Field Office/S7 Delegated Authority Program agrees based on other biological data or reasoning, subsequent avoidance and minimization measures for these species will be implemented.

SWWF-YBC-2, *Habitat Buffer.* A noise disturbance buffer of 500 feet will be maintained between noise-generating project activities and occupied or assumed occupied Southwestern willow flycatcher or yellow-bill cuckoo habitat. Noise buffer distances may be modified in coordination with the USFWS Field Office based on project specific characteristics or a Project Proponent/Action Agency may choose to submit their own analysis and buffer recommendations

for USFWS consideration. If sufficient buffers cannot be implemented, the proposed activities may lead to adverse effects, which are not covered under this consultation.

SWWF-YBC-3*, Minimizing Suitable Habitat Adverse Effects.* No permanent or temporary loss of native flycatcher or cuckoo occupied or presumed occupied habitat, or nonnative vegetation that supports essential breeding, feeding, and sheltering behaviors (e.g., tamarisk that supports willow flycatcher nesting), will occur (within or outside of the breeding season), unless determined to be insignificant at the project level.

SWWF-YBC-4*, Minimizing and Avoiding Critical Habitat Adverse Effects.* No permanent loss of designated critical habitat will occur, unless determined to be insignificant at the project level.

Mammals

There are four federally-listed mammal species that are being addressed in this PBO. A list of these mammal species is provided in Table 8.

General Mammal Protection Measures

There are no General Mammal Protection Measures identified in this section; however, measures are provided in this section for covered mammal species as identified in Table 8. Some of those measures for Covered mammals were grouped based on similar life history patterns and habitat requirements. Furthermore, several GPMs would reduce potential effects on these species. These measures include but are not limited to GPM2, *Construction Work Windows*; GPM3, *Construction Hours*; GPM4, *Environmental Awareness Training*; GPM5, *Environmental Monitoring*; GPM6, *Work Area and Speed Limits*; GPM7, *Environmentally Sensitive Area and/or Wildlife Exclusion*; ASP1, *Qualifications of the Qualified Biologist and USFWS-Approved Biologist*; ASP2, *Preconstruction Surveys; ASP-5, Airborne Noise Reduction*; GPM18, *Species Capture, Handling, and Translocation*; GPM19, *Entrapment Prevention*; WQHM3, *Erosion Control Plans*; WQHM4, *Hazardous Materials Management and Spill Response Plan*; and VHDR6 and VHDR7 (for herbicide use).

Table 8: Covered Species – **Mammals**
Self-Imposed Annual Take Limits and Effects Determinations

Common Name	Annual Take Limits	ESA Effects Individuals	ESA Effects Critical Habitat
riparian (=San Joaquin Valley) woodrat	Injury or mortality of no more than 2 individuals annually. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of a population in the project area.	LAA	Not Applicable
riparian brush rabbit	Injury or mortality of no more than 2 individuals annually. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of a population in the project area.	LAA	Not Applicable
salt marsh harvest mouse	Injury or mortality of no more than 4 individuals and 1 nest equivalent annually. 1 nest equivalent is equal to all young within the nest or 4 total juveniles if a nest is not found. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of a population in the project area. No net loss of habitat through implementation of protection measures and/or offsetting impacts with habitat restoration or enhancement.	LAA	Not Applicable
San Bernardino kangaroo rat	Not Applicable	NLAA	LAA

Notes:

Limits reset on January 1 each year. Limits apply to the entire range of the species (range-wide), unless otherwise indicated.

San Bernardino Kangaroo Rat

KRAT-1, *Conduct Habitat Assessment*. Prior to beginning project activities, a Qualified Biologist will conduct a habitat assessment in potentially suitable habitat in the project footprint to determine presence of kangaroo rat burrows or their sign (e.g., scat, tail drags and tracks, or skeletal remains in owl pellets). The habitat assessment surveys will be conducted within 60 days, and at least 14 days prior to the start of ground-disturbing activities. If no burrows or sign of kangaroo rats are detected, no further measures will be required.

KRAT-2*, Habitat Buffer.* An exclusionary buffer will be established between noise-generating project activities and occupied, or presumed occupied, habitat. The buffer distance will be determined by the USFWS-Approved Biologist in coordination with the respective USFWS Field Office/S7 Delegated Authority Program. A Project Proponent may choose to submit in their ESA Section 7(a)(2) Review Form with their own analysis and buffer recommendations for the USFWS' consideration.

KRAT-3*, Avoidance Areas*. Based on the results of the habitat assessment and if the exclusionary buffer established by KRAT-2, Habitat Buffer is not sufficient to include the distances described in 3a-3f, in areas where kangaroo rats are present or assumed present,[15] non-disturbance zones will be established prior to ground-disturbing activities.

a. Environmentally Sensitive Areas and/or Wildlife Exclusion (GPM-7) will be done in coordination with a USFWS-Approved Biologist around potentially suitable habitat within the project site boundaries, so that the potentially suitable habitat can be avoided during ground-disturbing activities. Barriers used will not involve trenching.

b. The contractor will maintain the avoidance zones around active burrows identified by a USFWS-Approved Biologist, with a minimum radius of 50 feet measured outward from the burrow entrance or cluster of entrances.

c. Actions in avoidance zones will be limited to essential vehicle and equipment operation on existing authorized roads and foot traffic. Actions in avoidance zones will be confined to daylight hours unless, at the discretion of the USFWS, operations at other times of day would be beneficial to kangaroo rats.

d. The avoidance zone radius may be altered in consultation with the USFWS, based on publication of new guidance, sensitivity of the site, proximity of existing disturbance, or other factors.

e. If project activities will take place within 50 feet of existing burrow entrances and, in the judgment of the USFWS-Approved Biologist, the combination of soil hardness and

[15] The Project Proponent will assume a species is present in an area when suitable habitat is present within the current range of the species and their absence has not been determined by a negative finding using protocol level surveys.

activity impact is not expected to collapse those burrows, then those project activities may take place under the supervision of the USFWS-Approved Biologist.

f. Activities authorized by the USFWS-Approved Biologist within 50 feet of burrow entrances will be documented and reported to USFWS.

KRAT-4*, Minimizing Suitable Habitat Adverse Effects.* No permanent or temporary loss of San Bernardino kangaroo rat occupied or presumed occupied habitat will occur unless take can be avoided and effects to the habitat are determined to be insignificant at the project level.

KRAT-5*, Minimizing and Avoiding Critical Habitat Adverse Effects.* No permanent loss of designated critical habitat will occur, unless determined to be insignificant at the project level.

Riparian Woodrat and Riparian Brush Rabbit

RW-RBR-1, *Habitat Assessment and Surveys*. Prior to implementing proposed vegetation-altering or ground-disturbing activities, a Qualified Biologist will conduct a field evaluation of suitable habitat for both species, for all covered activities that could occur in suitable habitat for these species in the project area. If the project cannot fully avoid effects on suitable habitat, species presence would be assumed. If the Project Proponent is interested in conducting protocol-level surveys to confirm presence or absence, in accordance with the USFWS *Habitat Assessment Guidelines and Survey Protocol for the Riparian Brush Rabbit and the Riparian Woodrat,* pre-approval by the USFWS for such work is required via the ESA Section 7(a)(2) Review Form process.

RW-RBR-2, *Habitat Avoidance (Occupied Habitat).* If occupied riparian woodrat or riparian brush rabbit habitat is present, or the habitat is assumed to be occupied, the Project Proponent will establish avoidance areas as follows:

- Project activities will be isolated from suitable riparian habitat that contains rabbit dens or woodrat middens, using ESAF.
- If lighting is required during construction, all lights will be screened, and directed down toward work activities and away from riparian habitat that is occupied or assumed to be occupied. A USFWS-Approved Biologist will ensure that lights are properly directed at all times.
- Not to exceed the self-imposed take limit of injury or mortality to no more than two individuals. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of a population in the project area.

RW-RBR-3, *Habitat Avoidance (Unoccupied Suitable Habitat*). If the suitable habitat is determined through surveys to be unoccupied, Project Proponent will implement the following measures (as appropriate) to minimize long-term effects on the habitat, and to allow the proposed project to provide for the recovery of the species:

- Floodplain restoration projects will be designed to minimize the removal of mature native vegetation in areas providing suitable habitat.

- Refugia from flood events in the restored floodplains will be included for individuals of these species that may come to occupy the area. Design considerations for refugia include distance between refugia (or travel time for target species to reach refugia), size of refugia (or ability of vegetation on refugia to provide cover and support nutritional needs of target species throughout flood season), connectivity of refugia to permanent high ground (for target species to escape from flooding), and/or accessibility by boat (to allow resource managers access to refugia if needed).

Salt Marsh Harvest Mouse

SMHM-1, *Vegetation Removal, Other Construction Activities, and Monitoring.* The following measure will be implemented to avoid and minimize effects to the salt marsh harvest mouse where construction activities would occur in suitable habitat within the current range of the species:

a. Potential adverse effects from project-related noise should be avoided or minimized to the maximum extent practicable by implementing sufficient disturbance buffers between noise-generating project activities and salt marsh harvest mouse habitat. Sufficient buffer distances can be determined in coordination with the USFWS. A Project Proponent/Action Agency may choose to submit their own analysis and buffer recommendations for the USFWS' consideration. If sufficient buffers cannot be implemented, the proposed activities may lead to adverse effects, including possible incidental take up to the program limits provided in Table 8, *Covered-Species – Mammals*.

b. A USFWS-Approved Biologist will identify suitable habitat prior to initiating construction; a Qualified Biologist or USFWS-Approved Biologist will be on site during all construction activities, including vegetation removal.

c. Disturbance to suitable habitat on levees and upland areas will be minimized. Vegetation will be cleared from all areas to be excavated, and where spoils will be deposited.

d. Vegetation will be removed from the work area and within a 15-foot buffer on both sides of the work area. Vegetation removal will be conducted using handheld motorized equipment (e.g., string trimmers and fixed-blade weed trimmers) unless the project site is not conducive to clearing in this manner, in which case other methods for clearing will be proposed in the Project ESA Section 7(a)(2) Review Form. Vegetation will be cleared under the direction of the USFWS-Approved Biologist in a manner that minimizes potential to kill or injure salt marsh harvest mice (e.g., cut in multiple passes, removed systematically from one area toward another to direct retreat, or other approaches). If harvest mice are encountered during vegetation clearing or other activities, work will be halted until the individual has left the area on its own or until the USFWS-Approved Biologist walks the marsh ahead of the

vegetation clearing to try and haze the mice out; due to the difficulty with field identification of salt marsh harvest mice, this will apply to all harvest mice.

e. Cut vegetation will be immediately removed from the cleared area as it is being cut, so that no standing or cut vegetation remains in the cleared area.

f. Vegetation removal will not occur during extreme high tides (6.5 feet or higher), when mice may be seeking refuge, to allow salt marsh harvest mice to access areas for refugia.

g. Construction will commence in cleared areas no less than 48 hours after vegetation clearing is completed (to allow for individuals to vacate the area) and no more than 10 days (to prevent re-growth of vegetation and subsequent reoccupation) at each given location.

h. Construction activities will be limited to 1 hour after sunrise to 1 hour before sunset.

i. Post-construction annual disturbance to vegetation in suitable habitat will be minimized and avoided when performing long-term monitoring and management activities.

j. Not to exceed the self-imposed take limit of injury or mortality of no more than two individuals and one nest equivalent. One nest equivalent is equal to all young within the nest or four total juveniles if a nest is not found. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of a population in the project area. No net loss of habitat through implementation of protection measures and/or offsetting impacts with habitat restoration or enhancement.

Invertebrates

There are ten federally-listed invertebrate species being addressed in this PBO. A list of these invertebrate species is provided in Table 9. Species Protection Measures are provided in this section for individual species to avoid or minimize potential adverse effects.

Table 9: Covered Species **– Invertebrates**
Self-Imposed Annual Take Limits and Effects Determinations

Common Name	Annual Take Limits	ESA Effects Individuals	ESA Effects Critical Habitat
California freshwater shrimp	No more than 3% of captured and relocated individuals killed per project.	LAA	Not Applicable

Common Name	Annual Take Limits	ESA Effects Individuals	ESA Effects Critical Habitat
conservancy fairy shrimp	No more than 10% temporary habitat loss per occupied pool. This limit can be exceeded for those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS FO, via the ESA Section 7(a)(2) Review Form Process.	LAA	LAA
longhorn fairy shrimp	No more than 10% temporary habitat loss per occupied pool. This limit can be exceeded for those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS FO, via the ESA Section 7(a)(2) Review Form Process.	LAA	LAA
Mount Hermon June beetle	No more than 20 individuals injured or killed annually.	LAA	Not Applicable
Riverside fairy shrimp	No more than 10% temporary habitat loss per occupied pool. This limit can be exceeded for those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS FO, via the ESA Section 7(a)(2) Review Form Process.	LAA	LAA

Common Name	Annual Take Limits	ESA Effects Individuals	ESA Effects Critical Habitat
San Diego fairy shrimp	No more than 10% temporary habitat loss per occupied pool. This limit can be exceeded for those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS FO, via the ESA Section 7(a)(2) Review Form Process.	LAA	LAA
Smith's blue butterfly	No more than 25 host plants lost annually.	LAA	Not Applicable
valley elderberry longhorn beetle	No more than 50 shrubs lost annually.	LAA	LAA
vernal pool fairy shrimp	No more than 10% temporary habitat loss per occupied pool. This limit can be exceeded for those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS FO, via the ESA Section 7(a)(2) Review Form Process.	LAA	LAA
vernal pool tadpole shrimp	No more than 10% temporary habitat loss per occupied pool. This limit can be exceeded for those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS FO, via the ESA Section 7(a)(2) Review Form Process.	LAA	LAA

Notes:

Limits reset on January 1 each year. Limits apply to the entire range of the species (range-wide), unless otherwise indicated.

LAA = ESA determination of may affect, and is likely to adversely affect

General Invertebrate Protection Measures

No General Invertebrate Protection Measures were identified. However, there are several GPMs that would reduce potential effects on these species. These measures include but are not limited to GPM-2, *Construction Work Windows*; GPM-4, *Environmental Awareness Training*; GPM-5, *Environmental Monitoring*; GPM-6, *Work Area and Speed Limits*; GPM-7, *Environmentally Sensitive Area and/or Wildlife Exclusion Fencing*; GPM-12, *Fugitive Dust Reduction*; ASP-1, *Qualifications of the Qualified Biologist and USFWS-Approved Biologist*; ASP-2, *Preconstruction Surveys*; ASP-3, *Species Capture, Handling, and Translocation*; and VHDR-6 and VHDR-7 (for herbicide use).

California Freshwater Shrimp

CAFS-1, *Preconstruction Survey.* A USFWS-Approved Biologist will conduct surveys of suitable habitat in the project area for presence of the California freshwater shrimp in the work area 24 hours prior to any vegetative clearing work, dewatering, or ground-disturbing activities. The USFWS-Approved Biologist will determine whether a visual survey of habitat is adequate to confirm the need for CAFS-4, or whether aquatic sampling is needed, and will implement the survey accordingly.

CAFS-2, *Work Window.* No work is permitted during wet weather or where saturated ground conditions exist; if a 60% chance of 0.5 inch of rain, or more, within a 24--hour period is forecast, then operations will cease until 24 hours after rain has ceased.

CAFS-3, *Site Access Restrictions.* New access routes requiring tree removal and grading will be limited to the extent practicable. Access routes will not be along the top of the stream bank, but relatively perpendicular (45 to 90 degrees is acceptable) to the bank. Where available, access to the work area will use existing ingress or egress points, or work will be performed from the top of the stream banks.

CAFS-4, *Capture and Relocation.* If California freshwater shrimp must be temporarily excluded from portions of the project area during in-water work, a project-specific capture and relocation plan should be submitted to USFWS for review and approval. It is recommended that the capture and relocation plan be provided to USFWS with the ESA Section 7(a)(2) Review Form to avoid delays in project implementation. The following procedures should be considered during development of the plan:

a. Prior to any California freshwater shrimp handle/capture activities, the USFWS will be contacted to identify relocations sites and options appropriate for the species in the location of the project activity.

b. California freshwater shrimp will be captured by hand-held nets (e.g., heavy-duty aquatic dip nets [12-inch Dframe net] or small minnow dip nets), relocated out of the work area in the net or placed in buckets containing stream water, and moved directly to the nearest suitable habitat in the same branch of the creek. To minimize holding time, suitable habitat will be identified prior to capturing California freshwater shrimp. Suitable habitat is defined as creek sections that will remain wet over the summer and where banks are

structurally diverse, with undercut banks, exposed fine root systems, overhanging woody debris, or overhanging vegetation. No California freshwater shrimp will be placed in buckets containing other aquatic species.

c. Once the USFWS-Approved Biologist has determined that all shrimp have been effectively relocated, barrier seines or exclusion fencing with mesh no greater than 5 millimeters will be installed to prevent shrimp from moving back in, as appropriate.

d. Capture, handling, and monitoring of California freshwater shrimp will be conducted by a USFWS-Approved Biologist, with assistance as necessary from another Qualified Biologist, to safely and effectively complete the task. The USFWS-Approved Biologist will take the lead on all capture, handling, and monitoring and will at all times be present and in direct supervision of any supporting Qualified Biologist(s). The USFWS-Approved Biologist will report the number of captures, releases, injuries, and mortalities to the USFWS within 30 days of project completion.

e. Not to exceed the self-imposed take limit of no more than 3% of captured and relocated individuals injured or killed per project.

CAFS-5, *Dewatering.* The Project Proponent will minimize the potential for California freshwater shrimp to be entrained during dewatering activities. Pump intakes will be placed away from complex vegetated banks that may contain habitat for California freshwater shrimp. Screens will be used during dewatering, in accordance with IWW-6, *Dewatering/Diversion*, and following CDFW (2001) and NMFS (1997) criteria for fry-sized salmonids (e.g., approach velocity will not exceed 0.33 foot per second in streams).

CAFS-6, *Habitat Protection.* Disturbance to low-velocity pool and run habitats occupied by shrimp, including all areas with undercut banks or vegetation overhanging into the water, will be avoided to the extent practicable. Disturbance and removal of aquatic vegetation will be minimized to the extent practicable. There will be no net loss of large woody debris in the active (wetted) channels. Trees may be removed for access routes for construction equipment. If trees need to be removed from other portions of the project site, willows greater than 3 inches in diameter at breast height will be left in place as is practicable, and the canopy cover provided by hardwoods or conifers will not be reduced unless necessary for access or other unforeseen circumstance. To the extent practicable when vegetation removal is required, willow crowns and roots will be left in place to allow for post-construction resprouting and reestablishment. Downed trees, stumps, and other habitat features and refuges in aquatic habitats will remain undisturbed as much as possible.

CAFS-7, *Rehabilitate Disturbed Habitat.* The stream bank will be planted with species that will enhance the year-round habitat value of the stream edge by providing adequate shelter, stability, complexity, and food production potential for California freshwater shrimp. Plantings may include widely spaced trees, willow sprigs and sedges near the water's edge, and plantings of herbaceous plant species to fill in gaps and augment existing habitat.

Mount Hermon June Beetle

MHJB-1, *Species Handling and Relocation*. Prior to construction, a USFWS-Approved Biologist will conduct construction crew training, in which individuals involved in construction will be provided a brief presentation about the biology of the Mount Hermon June beetle and shown pictures of the species during its various life stages in order to aid in its identification during construction. Construction personnel will be directed to cease work immediately and contact the USFWS-Approved Biologist to capture and relocate Mount Hermon June beetles, should one be observed within the project site. The Biologist will conduct regular inspections of the project site during construction to salvage and relocate individuals. Any potential larva or adult Mount Hermon June beetles encountered in an area that would be impacted by the proposed project will be relocated to intact habitat outside the impact area and re-buried at the approximate depth at which it was unearthed. If the Mount Hermon June beetle is found on the soil surface, then it will be relocated to a portion of the project site outside of the impact area and left on the soil surface in a location protected by vegetation.

Not to exceed the self-imposed take limit of no more than 20 individuals injured or killed annually.

MHJB-2, *Work Windows*. If ground disturbing activities are conducted during the flight season of the Mount Hermon June beetle (May 15 to August 15), suitable impervious materials will be placed over exposed soil by 7:00 p.m. each night to prevent dispersing males from burrowing and being impacted by subsequent soil disturbance.

MHJB-3, *Lighting*. No new outdoor lighting will be installed.

MHJB-4, *Landscaping Elements*. Landscaping elements, associated with restoration, that can degrade Mount Hermon June beetle habitat, will not be used. This includes elements such as turf grass, dense ground cover, weed matting, aggregate, and mulch.

Vernal Pool Branchiopoda

All vernal pool shrimp species, among the Covered Species, belong to the Branchiopoda class of crustaceans. Vernal pool fairy shrimp, conservancy fairy shrimp, longhorn fairy shrimp, Riverside fairy shrimp, and San Diego fairy shrimp all belong to the order Anostraca; however, vernal pool tadpole shrimp belong to the order Notostraca. Thus, when referring to all covered vernal pool animal species, the term Branchiopoda will be used.

Because proposed restoration projects intended to restore vernal pool habitat or restore habitat adjacent to vernal pools will be designed to protect or restore vernal pool ecosystems whether Covered Species are currently present or not, preconstruction surveys are not required, but are highly recommended. Proposed projects will follow the avoidance and minimization measures listed below to protect Covered vernal pool Branchiopoda, if present, and to protect suitable habitat even if Covered Species are not present. If a Project Proponent believes that their project would be best implemented following a finding of absence of Covered Species, the Project Proponent may conduct surveys following the USFWS (USFWS 2017a) (or most recent version) survey protocol, which can be used to demonstrate presence or absence of covered vernal pool

Branchiopoda. Based on that finding, the Project Proponent may propose alternate measures that meet the intent of measures included below for USFWS review and approval when submitting their ESA Section 7(a)(2) Review Form. Otherwise, all Project Proponents will follow the measures described below to protect vernal pool Branchiopoda and their habitat.

Vernal Pool Branchiopoda Protection Measures 1 through 9 apply to all projects but because VPBR-9(i) allows this 10% limit to be exceeded for those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS Field Office, via the ESA Section 7(a)(2) Review Form process, some of the Vernal Pool Branchiopoda Protection Measures below may not be applicable. In such cases, the USFWS Field Office will work the Project Proponent to identify project specific vernal pool species protection measures in order to minimize impacts during the restoration project.

VPBR-1, *Work Window.* Work within 250 feet of suitable Covered vernal pool Branchiopoda habitat (e.g., vernal pools or seasonal wetlands) will be performed between June 1 and October 15[16] under dry site conditions.

VPBR-2, *Biological Monitor.* A Qualified Biologist will monitor construction activities, as described in GPM5, Environmental Monitoring as well as all activities within 250 feet of suitable habitat for Covered vernal pool Branchiopoda, if encroachment on the 250-foot buffer described in VPBR3 is necessary.

VPBR-3, *Work Restrictions During the Wet Season.* Work should be planned to take place during the dry season whenever possible. If the Project Proponent determines that construction activities must occur during the October 15 through June 1 wet period, the ESAF and erosion control materials will be placed around vernal pools and other seasonal wetlands, as determined by the Qualified Biologist, to avoid sedimentation into vernal pool habitat or alteration of site hydrology. The fencing will provide a buffer between construction activities and the vernal pools and other seasonal wetlands. The Qualified Biologist will oversee the installation and maintenance of the fencing and monitor its integrity during construction, so that repairs can be made in a timely manner. If a 60% chance of 0.25 inch of rain or more within a 24-hour period is forecast, then operations will cease until 48 hours after rain has ceased. There will be no off-road traffic or other activities during the wet season in the vernal pool watershed that could negatively alter the hydrology of the vernal pool (e.g., by creating road ruts).

VPBR-4, *Site Restrictions.* A buffer of at least 250 feet from any vernal pool, vernal pool grassland, or seasonal wetland will be established for the following:

a. Staging areas of all equipment for storage, fueling, and maintenance with hazardous-material-absorbent pads available in the event of a spill

b. Mixing of pesticides, herbicides, or other potentially toxic chemicals

[16] Extended or alternative work windows may be considered on an individual project basis with prior approval from USFWS ES, provided the Project Proponent can demonstrate that measures implemented to avoid or minimize exposure would do so at a level commensurate with the standard work windows.

Nondisturbance exclusion zones will be established, maintained, and monitored by a Qualified Biologist. The Qualified Biologist will ensure that construction activity does not incidentally take vernal pool Branchiopoda or adversely impact their habitat outside of the project footprint, in areas where suitable habitat (e.g., vernal pools, seasonal wetlands) occurs and the species have potential to occur.

VPBR-5*, Erosion Control.* Any vernal pool, vernal pool grassland, or seasonal wetland will be protected from siltation and potentially contaminated runoff from construction equipment by use of erosion control measures. Erosion-control measures will be placed between the outer edge of the 250-foot buffer and the activity area.

VPBR-6*, Dust Control.* Dust control measures will be implemented to prevent the transport of soil from exposed surfaces to vernal pool, swale, and rock pool habitat. Sprinkling with water will not be done in excess, to minimize the potential for non-stormwater discharge. No application of water for dust suppression or other purposes will occur within or adjacent to vernal pool habitat without additional measures in place such as barriers and use of low flow water truck nozzles to keep water out of potential vernal pool Branchiopoda habitat during the dry season.

VPBR-7*, Prevent Hybridization.* To limit the potential for hybridization among related but geographically isolated Branchinectids through transport of their cysts, all equipment will be washed and kept clean of dirt, debris, and plant matter before entering the project area.

VPBR-*8, Herbicide Application, Clearing, and Ground Disturbance Near Vernal Pools.*

a. **Work Near Vernal Pools During the Dry Season**: A Qualified Biologist will flag or monitor all project implementation activities during the dry season (generally June 1 through October 15) within 250 feet of a vernal pool, vernal pool grassland, or seasonal wetland. The following buffers will be enforced:

    i. Hand-held herbicide application is prohibited in the pool or at the edge of the pool (as determined by the Qualified Biologist and indicated by features such as hydrophilic plants and topography).

    ii. Power spray herbicide application is prohibited within 100 feet of the edge of the pool.

    iii. Broadcast herbicide application is prohibited within 150 feet of the edge of the pool.

b. **Work Near Vernal Pools During the Wet Season:** A Qualified Biologist will flag or monitor all project implementation activities during the wet season (generally October 1 through June 1) within 150 feet of a vernal pool, vernal pool grassland, or seasonal wetland. The following buffers will be enforced:

i. Hand-held herbicide application is prohibited within 25 feet of the edge of the pool (as determined by the Qualified Biologist and indicated by features such as hydrophilic plants and topography).

ii. Power spray herbicide application is prohibited within 100 feet of the edge of the pool.

iii. Broadcast herbicide application is prohibited within 150 feet of the edge of the pool.

iv. Manual clearing of vegetation is prohibited at the pool or within the edge.

v. Mechanical clearing of vegetation is prohibited within 100 feet of the edge of the pool.

vi. Nonmechanical ground-disturbing activities that are conducted by hand or with hand tools are prohibited within 50 feet of the edge of the pool.

VPBR-9*, Ground Disturbance in Vernal Pools*. If the intent of a Proposed Restoration Project is to improve habitat for Covered Species of vernal pool Branchiopoda (e.g., enlarge, deepen, repair, or otherwise modify suitable aquatic habitat), and would require ground disturbance in suitable habitat, the Project Proponent will submit detailed project design information for review and approval by the USFWS Field Office in the ESA Section 7(a)(2) Review Form. Any ground-disturbing activities within 25 feet of the edge of the pool will be conducted consistent with a plan reviewed and approved by the USFWS Field Office and will be conducted during the dry season. The following measures may also apply and should be considered during development of the plan:

a. If inoculum from an existing site will be used for restoration/enhancement, the plan will identify any proposed donor pools and include documentation that the pools are free of versatile fairy shrimp (*Branchinecta lindahli*). No more than 5% of the basin area of any donor pool will be used for collection of inoculum.

b. Restoration plans that include grading or regrading of vernal pools will include all final specifications and topographic-based grading, planting, and watering plans for the vernal pools, watersheds, and surrounding uplands (including adjacent mima mounds) at the restoration sites. The grading plans will also show the watersheds of extant vernal pools, and overflow pathways that hydrologically connect the restored pools in a way that mimics natural vernal pool complex topography/hydrology.

c. Restoration plans that include grading or regrading of vernal pools will include a hydraulic analysis that shows each proposed vernal pool and its watershed, and a calculation showing vernal-pool-to-watershed ratio. The vernal-pool-to-watershed ratio will be similar to extant pools closest to the restoration area.

d. Prior to ground disturbance in suitable habitat, loose substrate, which may include cysts of Branchiopoda, will be collected from the pool area to be disturbed by vacuum and

stored in dry conditions until grading is complete. All collected substrate that may contain cysts of Branchiopoda will be temporarily stockpiled onsite, maintained in ambient conditions, and protected from rain and wind for subsequent redeposition in restored vernal pool areas.

e. Topsoil will be removed and stockpiled separately.

f. Disturbance of the less permeable, hardpan or claypan soil layer that often helps form vernal pools will be minimized. If the less permeable layer must be removed, it will be stockpiled separately.

g. When grading is complete, layers will be replaced in the reverse of the order in which they were removed; replacement will begin with subsoil, followed by the less permeable layer, then topsoil, and then loose material collected by vacuum. Subsoil and less permeable layers should each be compacted following placement to decrease permeability of restored or modified suitable habitat.

h. Any groundwater encountered in excavations within vernal pool habitats during dry season work will be pumped into a water truck and discharged offsite or discharged in areas onsite where it will not migrate back into these habitats.

i. Not to exceed the self-imposed take limit of no more than 10% temporary habitat loss per occupied pool. This limit can be exceeded for those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS FO, via the ESA Section 7(a)(2) Review Form Process.

Valley Elderberry Longhorn Beetle

VELB-1, *Protocol Implementation*. For the valley elderberry longhorn beetle, the Project Proponent will be required to follow the Protection Measures presented in the *May 2017 USFWS Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle*, or the most updated version of this guideline document (USFWS 2017b). The Project Proponent must implement the valley elderberry longhorn beetle Framework on projects that may affect valley elderberry longhorn beetle. If elderberry shrubs occur on or within 50 meters (165 feet) of the project area, adverse effects to valley elderberry longhorn beetle may occur as a result of project implementation. If the project may affect valley elderberry longhorn beetle or its habitat, the applicable Species Protection Measures identified in the Framework will be followed as a requirement for ESA compliance. Because not all measures may be appropriate for every project, Project Proponents will identify the measures that are applicable to their specific project through technical assistance with the appropriate USFWS Field Office prior to submitting an ESA Section 7(a)(2) Review Form for coverage under the PBO.

Not to exceed the self-imposed take limit of no more than 50 shrubs lost annually.

VELB-2, *Elderberry Plantings.* When the project includes riparian plantings and is in the range of the VELB, include elderberry seedlings in the planting mix.

General Butterfly Protection Measures

The following General Butterfly Protection Measures apply to Smith's blue butterfly and should be considered for inclusion in the project (via the ESA Section 7(a)(2) Review Form). In addition, there are several GPMs that would reduce potential effects to these species. These measures include but are not limited to GPM-2, *Construction Work Windows*; GPM-4*, Environmental Awareness Training*; GPM-5, *Environmental Monitoring*; GPM-7, *Environmentally Sensitive Area and/or Wildlife Exclusion*; GPM-12*, Fugitive Dust Reduction*; ASP-2*, Preconstruction Surveys*; WQHM-3, *Erosion Control Plans*; and VHDR-6 and VHDR-7 (for herbicide use).

Butterfly-1, *Preconstruction Survey.* The Project Proponent will implement the following measures, depending on the time of year for project construction:

a. During the nonflight season (Table 11), preconstruction surveys for caterpillars and the larval host plants will be conducted during the typical bloom season. A Qualified Biologist, able to identify the larval host plants and caterpillars of Smith's blue butterfly, will conduct at least one and as many as three surveys prior to the start of construction to determine the use of the site by Smith's blue butterfly.

b. During the flight season (Table 11), preconstruction surveys for Smith's blue butterfly and the larval host plants will be conducted. A Qualified Biologist, able to identify the butterflies and their host plants, will conduct as many as three surveys prior to the start of construction, to determine the use of the site by Smith's blue butterfly. If flight surveys are not possible, the butterfly species associated with the larval host plant will be assumed to be present.

Table 10: Covered Species – **Butterflies**

Butterfly Species	**Adult Butterfly Flight Season**	**Host Plants**	**Larval Host Plant Typical Bloom Season**
Smith's blue butterfly	Mid-June to early September, depending on the blooming period of Eriogonum.	Coast buckwheat (*Eriogonum latifolium*) and seacliff buckwheat (*E. parvifolium*). Adults may also take nectar from naked buckwheat (*E. nudum*).	June through September (coast buckwheat); year-round (seacliff buckwheat).

Butterfly-2, *Site Restrictions.* Access routes, staging areas, and total project footprint in butterfly habitat will be limited to the minimum necessary to achieve the project goal.

Butterfly-3, *Biological Monitor.* Biological monitoring will be overseen by a USFWS-Approved Biologist. During the adult flight season of Smith's blue butterfly (see Table 10), a Qualified Biologist will be present when construction activities occur in or within 150 feet of suitable habitat (dispersal habitat as well as areas containing the larval host plant and adult food

plants). During monitoring, the Qualified Biologist will monitor for Smith's blue butterfly species, inspect the fencing/flagging, and immediately notify the resident engineer (or their designated contact) to address any necessary fencing/flagging repairs.

Butterfly-4, *Environmentally Sensitive Areas.* Any larval food or host plants found within 300 feet of the project footprint will be clearly marked.

a. For projects where Smith's blue butterfly species are present or assumed to be present, larval food or host plants will be avoided to the maximum extent practicable (see Table 10).

b. For all projects where Smith's blue butterfly are present or assumed to be present, prior to any ground-disturbing or vegetation removal activities, the edge of the work area near any larval food or host plants will be clearly marked in coordination with a USFWS-Approved Biologist to prevent workers and vehicles from entering this area.

c. A Qualified Biologist will supervise the installation of fencing/flagging around stands of known Smith's blue butterfly host/food plants. The fencing/flagging will be placed the maximum distance from the plants possible (up to 100 feet), while still allowing work to occur in the adjacent area. The location of the fencing/flagging will be field-adjusted by the Qualified Biologist, as necessary. The temporary fencing/flagging will be furnished, constructed, maintained, and later removed on completion of the project. Temporary fencing/flagging will be at least 4 feet high and constructed of high-visibility material (e.g., orange, commercial-quality woven polypropylene or similar material). No heavy equipment will be permitted in the fenced/flagged area. Warning signs indicating the sensitivity of the area will be attached to the fencing/flagging.

d. Not to exceed the self-imposed take limit of no more than 25 host plants lost annually.

Butterfly-5*, Dust Control.* The Qualified Biologist will ensure that dust is controlled by construction personnel by periodically watering down areas within 100 feet of Smith's blue butterfly habitat, as necessary. Watering down the construction area will prevent dirt from becoming airborne and accumulating on larval host plants and adult food source plants for Smith's blue butterfly. See GPM-12, *Fugitive Dust Reduction*, for further information on dust control.

Butterfly-6, *Encounters with Species*. If one or more adult Smith's blue butterfly are observed in the work area, work activities will temporarily cease unless the USFWS-Approved Biologist determines that impacts have been avoided or minimized to the greatest extent practicable.

If work is stopped and the USFWS-Approved Biologist needs additional guidance, USFWS will be contacted as soon as is reasonably possible.

Butterfly-7*, Restoration of Disturbed Areas.* Restoration of temporary impacts to Smith's blue butterfly habitat will occur in accordance with a restoration plan that is reviewed and approved by the appropriate USFWS Office prior to implementation of the Proposed Restoration Project.

All temporary impacts will be restored with an assemblage of native species consistent with the habitat affected and will include host plants found in the vicinity of the project area.

Fish

There are five federally-listed fish species being addressed in this PBO. A list of these fish species is provided in Table 11. The General Fish Protection Measures described in this section are applicable to all species identified in Table 11. In addition, Species Protection Measures are provided in this section for individual species to avoid or minimize potential adverse effects.

Table 11: Covered Species – **Fish**
Self-Imposed Annual Take Limits and Effects Determinations

Common Name	Annual Take Limits	Effects Determination – Individuals	Effects Determination – Critical Habitat
Delta smelt	No more than 1 individual injured or killed annually. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of the population in the project area. No net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.	LAA	LAA
Lahontan cutthroat trout	No more than 20 NTUs 500 feet downstream of the project site or no more than 20% above background conditions, whichever is greater. No more than 3% of capture and relocations injured or killed.	LAA	Not Applicable
longfin smelt – San Francisco Bay-Delta DPS	No more than 40 individuals killed, injured, captured, or relocated annually.	LAA	Not Applicable
tidewater goby	No more than 10% of all individuals captured and relocated may be injured or killed per project.	LAA	LAA
unarmored threespine stickleback	No more than 2 individuals injured or killed per local population annually.	LAA	Not Applicable

Notes:

NTU = Nephelometric Turbidity Unit

Limits reset on January 1 each year. Limits apply to the entire range of the species (range-wide), unless otherwise indicated.

LAA = ESA determination of may affect, and is likely to adversely affect
NLAA = ESA determination of may affect, and is not likely to adversely affect

General Fish Protection Measures

General Fish Protection Measures listed in this section should be considered for inclusion in the project (and indicated via the ESA Section 7(a)(2) Review Form) if the project may affect any of the covered fish species listed in Table 11. In addition to these General Fish Protection Measures, several GPMs, as applicable, are important to protect these species. These GPMs include but are not limited to GPM-2, *Construction Work Windows*; GPM-4, *Environmental Awareness Training*; GPM-5, *Environmental Monitoring*; ASP-1, *Qualifications of the Qualified Biologist and USFWS-Approved Biologist*; ASP-2, *Preconstruction Surveys*; GPM-18, *Species Capture, Handling, and Translocation*; WQHM-3, *Erosion Control Plans*; WQHM-4, *Hazardous Materials Management and Spill Response Plan*; IWW-1 through IWW-13 (In-Water Work); and VHDR-6 and VHDR-7 (for herbicide use).

FISH-1, *Habitat Disturbance Avoidance and Minimization.* Disturbance to aquatic habitat for covered fish species will be avoided and/or minimized to the maximum extent practicable, unless the purpose of the project is to provide overall benefits to the species and the benefits are greater than any temporary impacts to habitat.

FISH-2, *Habitat Assessment and Surveys.* For projects that may result in impacts to aquatic habitat within the range of covered fish species, no less than 30 days prior to construction of the project, the Project Proponent will evaluate the potential for covered fish species to be present in the project area. The evaluation may be based on existing information if sufficiently available, or the Project Proponent may conduct a habitat assessment or focused survey for those species, if appropriate. An example where it may not be appropriate to conduct a survey is when electrofishing or seining could result in mortality (e.g., mortality of tidewater goby), and it is preferred to assume species presence. The habitat assessment and/or survey will be conducted in potentially suitable aquatic habitat within 300 feet of the proposed project. The Qualified Biologist will conduct the habitat assessment and/or fish survey and will adhere to the standards provided in the CDFW *California Salmonid Stream Habitat Restoration Manual 4th Edition Volume I: Section IV* (CDFW 2010). If Covered fish species are observed during the survey or the habitat is otherwise potentially occupied, based on the results of the habitat assessment or existing information, the Project Proponent will implement *FISH-3, Fish Capture and Relocation*, as described below.

FISH-3, *Fish Capture and Relocation.* For projects that require dewatering or other work in suitable habitat for the covered fish species (as identified in FISH-2), if fish capture and relocation would be the most protective approach to managing fish during construction, then a fish capture and relocation plan will be developed and submitted to the appropriate USFWS Office for approval as part of the ESA Section 7(a)(2) Review Form submittal. The plan will describe the biologist's qualifications, capture methods, capture and relocation work areas, and reporting requirements, including details in the list below. If capture and relocation is not feasible or would not be the most protective approach to managing fish in the work area (e.g., if

dewatering is not needed or appropriate; or if fish are in a large, unconfined waterbody), other methods to protect covered fish species (e.g., timing restrictions around season and tide, or bubble curtains) should be detailed in a plan and submitted to USFWS for approval. It is recommended that the capture and relocation plan be submitted with the ESA Section 7(a)(2) Review Form to avoid delays.

a. This plan will incorporate the latest USFWS and NMFS guidance relating to the capture and relocation of fish, as applicable.

b. Procedures for decontamination of any equipment used in the capture and relocation of fish will be identified.

c. Prior to the implementation of capture and relocation activities, relocation (or release) sites will be identified by the USFWS-Approved Biologist, based on proximity, access, habitat suitability, and potential to be affected by construction-related disturbance. Suitable habitat for relocation sites will be in the same watershed/subwatershed basin where fish were originally captured. One or more of the following methods will be used to capture protected fish species: electrofishing, dip net, seine, throw net, minnow trap, and hand.

d. Fish relocation will only be conducted (or led) by a USFWS-Approved Biologist. If a USFWS-Approved Biologist is needed, the Project Proponent will submit the biologist's qualifications to the appropriate USFWS Office for approval 30 days prior to project construction. The USFWS-Approved Biologist will have knowledge and experience in fish biology and ecology; fish/habitat relationships; biological monitoring; handling, collecting, and relocating fish; or other relevant experience.

e. Residual surface water associated with the diverted or dewatered habitat will be monitored or sampled for the presence of fish by a USFWS-Approved Biologist as soon as the waters are isolated. If a Covered Species of fish is observed in the isolated habitat, they will be immediately captured and relocated to the suitable habitat outside of the construction area, but in the same water basin, by the USFWS-Approved Biologist, in accordance with the approved fish capture and relocation plan.

f. The USFWS-Approved Biologist will relocate any stranded covered fish species to an appropriate place, depending on the life stage of the fish and consistent with the USFWS-Approved rescue and relocation plan.

g. The USFWS-Approved Biologist will note the number of individuals observed in the affected area, the number of individuals relocated, the approximate size of individuals, the location of capture and release, any instances of injury or mortality, and the date and time of the collection and relocation. This information will be reported to the appropriate USFWS Office within 7 days of completion of the fish capture and relocation effort.

FISH-4*, Reporting.* The USFWS-Approved Biologist will provide a written summary of work performed (including biological survey and monitoring results), BMPs implemented (e.g., use of biological monitoring, flagging of work areas, or erosion and sedimentation controls), and

supporting photographs of each stage to the appropriate USFWS Office. Furthermore, the documentation describing Covered Species surveys and relocation efforts (if appropriate) will be completed in accordance with the requirements of *FISH-3, Fish Capture and Relocation*.

Tidewater Goby

TIGO-1, *Capture and Relocation.* Capture and relocation of tidewater goby will be conducted by a USFWS-Approved Biologist in accordance with the requirements of *FISH-3, Fish Capture and Relocation*. Fish rescue and relocation will be conducted as described in the USFWS-Approved fish rescue and relocation plan submitted by the Project Proponent. Gobies will be transported in separate containers from larger size class fish to avoid predation. Seining and dipnetting are the preferred methods of capturing fish, but electrofishing may be required to capture fish in complex habitats. For projects that do not require dewatering but cannot complete in-water work in one day, successive sets of block nets may be required each day, and subsequent surveys and capture/relocation may be performed accordingly. Once the block nets are secured, a USFWS-Approved Biologist will remove all tidewater gobies found between them, using a 1/8--inch seine and dip nets. The USFWS-Approved Biologist will then relocate tidewater gobies to suitable habitat downstream of the project area. Fish released from one day's work will not be released into areas projected to be excavated on successive days. Not to exceed the self-imposed take limit of no more than 10% of the individuals captured and relocated at any individual project site may be injured or killed. If this self-imposed take limit is reached, the Project Proponent will stop work in tidewater goby habitat and contact the USFWS Field Office.

Unarmored Threespine Stickleback

Currently, the unarmored threespine stickleback is restricted to three areas: the upper Santa Clara River and its tributaries in Los Angeles County; San Antonio Creek on Vandenberg Air Force Base in Santa Barbara County; and the Shay Creek vicinity (which includes Shay Pond, Sugarloaf Pond, Juniper Springs, Motorcycle Pond, Shay Creek, Wiebe Pond, and Baldwin Lake) in San Bernardino County (Moyle 2002). San Felipe Creek in San Diego County is another area that may support the unarmored threespine stickleback; however, its current status is unknown. Therefore, all projects in or immediately adjacent to these four locations will implement the subsequent protection measures to avoid or minimize the potential for effects to these species.

UTS-1, *Habitat Disturbance*. Projects requiring disturbance in known or potentially occupied suitable habitat for the unarmored threespine stickleback will require the following information to be included with the ESA Section 7(a)(2) Review Form for USFWS review and approval: detailed project design information; and an explanation of how impacts to unarmored threespine stickleback and its critical habitat will be minimized. This information will allow the Project Proponent and USFWS to determine if any additional conservation measures are necessary.

Not to exceed the self-imposed take limit of no more than two individuals injured or killed per local population annually.

Delta Smelt

Delta smelt occurs in the Sacramento-San Joaquin Delta (Delta). Therefore, all projects in the Delta will implement the following protection measure to avoid or minimize the potential for effects to this species.

DS-1, *Work Windows.* In-water work occurring in waters potentially supporting Delta smelt will occur between August 1 and November 30.[17]

Not to exceed the self-imposed take limit of no more than one individual injured or killed annually. The local USFWS Field Office and Project Proponent will work together during the ESA Section 7(a)(2) Review Form process to ensure an individual project does not adversely affect a significant portion of the population in the project area. The self-imposed take limit also requires no net loss of habitat through the protection measures and/or offsetting impacts with habitat restoration or enhancement.

Lahontan Cutthroat Trout

LCT-1, *Work Windows.* In-water work occurring in waters potentially supporting Lahontan cutthroat trout rearing and migration, but not spawning, will occur between July 1 and March 31. In-water work occurring in waters potentially supporting Lahontan cutthroat trout spawning will occur between October 1 and March 31. If preconstruction monitoring during the spawning season demonstrates that juveniles have emerged from the gravel and are mobile and able to avoid disturbance prior to October 1, and with written approval from the USFWS Field Office (e.g., email), in-water work may begin in spawning habitat prior to October 1. Not to exceed the self-imposed take limit of no more than 20 NTUs 500 feet downstream of the project site or 20% above background conditions (whichever is greater) and not to exceed 3% of capture and relocations injured or killed.

Longfin Smelt (San Francisco Bay-Delta DPS)

LFS-1, *Work Windows.* Perform in-water work during the general in-water work window for the San Francisco Bay from June 1 to November 30. Proposed projects in known longfin smelt spawning areas, sloughs, and tributaries may be restricted from August 1 to September 30.

Perform all in-water work during low tide, to the greatest extent possible.

LFS-2, *Capture and Relocation*. Capture and relocation of longfin smelt will be conducted by a Qualified Biologist in accordance with the requirements of FISH-3, *Fish Capture and Relocation*. Fish rescue and relocation will be conducted as described in the USFWS approved fish rescue and relocation plan submitted by the Project Proponent to the local USFWS Field Office concurrently with the ESA Section 7(a)(2) Review Form or at least 60 days before construction. Early submission facilitates timely USFWS review and approval and helps avoid

[17] Extended or alternative work windows may be considered on an individual project basis with prior approval from USFWS ES, provided the Project Proponent can demonstrate that measures implemented to avoid or minimize exposure would do so at a level commensurate with the standard work windows.

project delays. Longfin smelt will be transported in separate containers from larger size class fish to avoid predation. Seining and dip-netting are the preferred methods for fish capture.

For projects that do not require dewatering, but cannot complete in-water work in one day, successive sets of block nets may be required each day, and subsequent surveys and capture/relocation may be performed accordingly. Once block nets are secured, a Qualified Biologist will remove all longfin smelt found between them, using a 1/8-inch seine and dipnets. The Qualified Biologist will then relocate longfin smelt to suitable habitat outside of the project area.

Plant Species: Vernal Pool and Non-Vernal Pool Species

There are 29 federally-listed plant species being addressed in this PBO. Table 12 provides a list of the vernal pool and other plant species. The General Plant Species Protection Measures described in this section are applicable to all species provided in Table 12.

Table 12: Covered Species – **Plants**

	ESA Effects Determinations	
Common Name	**Individuals**	**Critical Habitat**
Butte County meadowfoam	LAA	LAA
California Orcutt grass	LAA	Not Applicable
Contra Costa goldfields	LAA	LAA
few-flowered navarretia	LAA	Not Applicable
fleshy owl's-clover	LAA	LAA
hairy Orcutt grass	LAA	LAA
Hoover's spurge	LAA	LAA
Otay Mesa-mint	LAA	Not Applicable
Sacramento Orcutt grass	LAA	LAA
San Diego ambrosia	LAA	LAA
San Diego button-celery	LAA	Not Applicable
San Joaquin (San Joaquin Valley) Orcutt grass	LAA	LAA
slender Orcutt grass	LAA	LAA
spreading navarretia	LAA	LAA
thread-leaved brodiaea	LAA	LAA
Ben Lomond spineflower	LAA	Not Applicable

Common Name	ESA Effects Determinations	
	Individuals	Critical Habitat
California seablite	LAA	Not Applicable
Howell's spineflower	NLAA	Not Applicable
La Graciosa thistle	LAA	LAA
marsh sandwort	LAA	Not Applicable
palmate-bracted bird's-beak	NLAA	Not Applicable
pedate checker-mallow	NLAA	Not Applicable
salt marsh bird's beak	LAA	Not Applicable
Santa Ana River woolly-star	NLAA	Not Applicable
slender-horned spineflower	NLAA	Not Applicable
soft bird's-beak	NLAA	NLAA
Sonoma alopecurus	NLAA	Not Applicable
Suisun thistle	NLAA	NLAA
Ventura marsh milk-vetch	LAA	LAA

LAA = ESA determination of may affect, and is likely to adversely affect
NLAA = ESA determination of may affect, and is not likely to adversely affect

General Plant Protection Measures

General Plant Protection Measures in this section should be considered for inclusion in the project (and indicated via the ESA Section 7(a)(2) Review Form) if any of the covered plant species listed in Table 12 may be affected by the proposed project. In addition to these General Plant Protection Measures, several GPMs, as applicable, are important to protect these species. These GPMs include but are not limited to GPM-4, *Environmental Awareness Training*; GPM-5, *Environmental Monitoring*; GPM-7, *Environmentally Sensitive Area and/or Wildlife Exclusion Fencing*; GPM-8, *Prevent Spread of Invasive Species*; GPM-9, *Practices to Prevent Pathogen Contamination*; GPM-12, *Fugitive Dust Reduction*; ASP-1, *Qualifications of the Qualified Biologist and USFWS-Approved Biologist*; ASP-2, *Preconstruction Surveys*; WQHM-3, *Erosion Control Plans*; WQHM-4, *Hazardous Materials Management and Spill Response Plan*; VHDR-1 through VHDR-5 (*Vegetation/Habitat Disturbance and Revegetation*), and VHDR-6 through VHDR-8 (for herbicide use).

General Plant Protection Measures *PLANT1* through *PLANT6* are focused on avoiding impacts to Covered plant species. PLANT7 includes measures for when effects cannot be avoided. Plant Protective Measures 1 through 7 apply to all projects but impacts up to 10% of some pools may be authorized because of the self-imposed take limit for Conservancy fairy shrimp, Longhorn

fairy shrimp, Riverside fairy shrimp, San Diego fairy shrimp, Vernal pool fairy shrimp, and Vernal pool tadpole shrimp. As a result, vernal pool plant species that occur in such pools may be adversely affected by project activities. In addition, because this 10% limit can be exceeded for those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS Field Office, via the ESA Section 7(a)(2) Review Form process, some of the plant protection measures below may not be applicable. In such cases, the USFWS Field Office will work the Project Proponent to identify project specific vernal plant species protection measures in order to minimize impacts during the restoration project.

PLANT-1*, Habitat Assessment and Surveys.* If the project area can potentially support Covered plant species, a Qualified Biologist will conduct a survey for Covered plant species within 1 year prior to commencement of ground-disturbing activities, to capture the bloom period(s) of all covered plant species with potential to occur. The USFWS-approved species-specific habitat assessment and survey protocols at the time when this document was written are listed below in the Species-Specific Measures. Existing methodologies may change and new methodologies may be developed. Project proponents should coordinate with the respective USFWS Field Office about protocols when developing a project description/completing the ESA Section 7(a)(2) Review Form. Surveys should follow USFWS's *General Rare Plant Survey Guidelines* (Cypher 2002); and CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018), or their most recent equivalents. Additional guidelines are provided for Burke's goldfields, a plant of the Santa Rosa Plain (USFWS 1996a). If surveys are not possible, then covered plants will be assumed to be present in all suitable habitats in the project area.

- **Timing**: The survey(s) must be conducted when all potentially occurring covered plants are identifiable, usually in the flowering, peak flowering, or fruiting stage. Blooming time periods are provided in Table 13.
- **Reference Populations:** Known nearby reference populations should be visited to confirm annual blooming period and identification at the same time as the survey(s).
- **Method:** Surveys will be conducted in a manner that avoids direct impact (e.g., crushing) of Covered or other sensitive plants.
- **Flagging:** All identified Covered Species will be flagged prior to senescence. Flagging or other field markers identifying the plants—or, in the event that protocol-level surveys were not conducted, the suitable habitat—will be placed prior to each work event and removed after that work event is completed for all phases of the proposed project.
- **Reporting:** The Project Proponent will submit a report to the USFWS in advance of any ground-disturbing activities. The report will provide the results of all surveys, a summary of all the data collected, and the habitat assessment. Information regarding the location of Covered plant populations will be provided to CDFW's CNDDB according to their reporting protocols.

Table 13: Covered Plant Species Blooming Periods

Common Name	Blooming Period

Ben Lomond spineflower	April to June
Butte County meadowfoam	March to May
California Orcutt grass	April to August
California seablite	July to October
Contra Costa goldfields	March to June
few-flowered navarretia	May to June
fleshy owl's-clover	April to May
hairy Orcutt grass	May to September
Hoover's spurge	July to October
Howell's spineflower	May to July
La Graciosa thistle	May to August
marsh sandwort	May to August
Otay Mesa-mint	May to July
palmate-bracted bird's-beak	May to October
pedate checker-mallow	May to August
Sacramento Orcutt grass	April to September
salt marsh bird's-beak	May to November
San Diego ambrosia	April to October
San Diego button-celery	April to June
San Joaquin (=San Joaquin Valley) Orcutt grass	April to September
Santa Ana River woolly-star	April to September
slender Orcutt grass	May to October
slender-horned spineflower	April to June
soft bird's-beak	June to November
Sonoma alopecurus	May to July
spreading navarretia	April to June
Suisun thistle	July to September
thread-leaved brodiaea	March to June
Ventura marsh milk-vetch	June to October

PLANT-2, *Exclusion Buffer Establishment.* A minimum 50-foot avoidance buffer around all Covered plants or their suitable habitat to be avoided will be clearly delineated with flagging or field markers. A larger exclusion buffer may be established if determined by the Qualified Biologist to be necessary for the protection of the Covered plants. No work activity will occur within the exclusion buffer, except as permitted under Measure *PLANT4, Work Restrictions in the Exclusion Buffer*. Additionally, a buffer of at least 300 feet from any vernal pool, vernal pool grassland, or seasonal wetland, known Covered plants occurrence, or designated critical habitats will be established for the following:

a. staging areas of all equipment for storage, fueling, and maintenance, with hazardous-material-absorbent pads available in the event of a spill

b. mixing of pesticides, herbicides, or other potentially toxic chemicals

Routine maintenance activities within 250 feet of vernal pool and swale habitat will be avoided, to the maximum extent possible.

PLANT-3*, Exceptions to Work Restrictions in the Exclusion Buffer.* If a USFWS-Approved Biologist determines that some work activities can take place within the exclusion buffer described in Measure PLANT-3 without causing any adverse direct or indirect impacts to Covered plants identified for avoidance, those approved work activities may be conducted within the exclusion buffer. Covered vernal pool plants will be clearly marked by a USFWS-Approved Biologist prior to worker entry into the exclusion buffer. Workers may only enter the exclusion buffer when accompanied by a Qualified Biologist, and all work within the exclusion buffer will be monitored by a Qualified Biologist. Based on the results of the botanical surveys, complete avoidance of populations onsite during their respective blooming periods will be applied for the following four Covered plant species with limited populations: Ben Lomond spineflower, soft bird's-beak, Suisun thistle, and Howell's spineflower.

PLANT-4*, Additional Seasonal Avoidance of Vernal Pool Plant Species and Other Covered Annual and Perennial Species Beyond the Exclusion Buffer.*

a. ***For Vernal Pool Plant Species**:* Work within 250 feet of suitable Covered vernal pool plant habitat (e.g., vernal pools, seasonal wetlands) will be performed between June 1 and October 15 under dry site conditions to the maximum extent possible, to minimize potential adverse impacts to aquatic habitats. If any construction activities remain and must occur during the October 16 to May 31 wet period, exclusion fencing and erosion control materials will be placed around the vernal pools and other seasonal wetlands, as determined by the Qualified Biologist, to reduce sedimentation into vernal pool habitat. The fencing will provide a buffer between construction activities and the vernal pools and other seasonal wetlands. The Qualified Biologist will oversee, monitor, inspect, and maintain the exclusion fencing.

b. ***For Other Covered Annual Species**:* To avoid impacts to other Covered annual plant species, work will be timed to occur after plants have set seed and senesced, avoid soil disturbance, and avoid actions that have the potential to reduce habitat quality. This measure is not applicable to Menzies' wallflower (a monocarpic perennial), which can live many years as a small rosette before flowering. Optimal work windows are August 1 through October 31 for Howell's spineflower. Known occupied habitat, as it is displayed in CNDDB for Howell's spineflower, will be avoided. If a project would occur in known occupied habitat of Howell's spineflower species, then the Project Proponent should consult with the appropriate USFWS Field Office individually for a potential "Likely to Adversely Affect" LAA determination.

PLANT-5*, Biological Monitoring.* A Qualified Biologist will monitor all construction activities, as described in GPM-5, *Environmental Monitoring*, and also within the buffers established under *PLANT-3, Exclusion Buffer Establishment*. Any non-disturbance exclusion zones will be established, maintained, and monitored. The Qualified Biologist will ensure that loss of Covered plants or destruction of their habitat does not occur outside of the project footprint.

PLANT-6*, Herbicide Application, Clearing, and Ground Disturbance Near Covered Plants.* If mechanical removal is not effective, or could damage sensitive habitats, limited herbicide application may occur as noted below and in accordance with GPMs VHDR-6 through VHDR-8. See also *VPBR-8, Herbicide Application, Clearing, and Ground Disturbance Near Vernal Pools,* for measures to protect vernal pool plants.

a. **Work Near Other Covered Plant Species (Nonvernal Pool Species)**: To avoid impacts to other Covered Species (non-vernal pool species), the following protections will be applied:

   i. Application of herbicide will occur during dry conditions, to the maximum extent practicable.

   ii. Backpack and hand-held herbicide application, if applied in dry conditions, is prohibited within 5 feet of any Covered plant. Protect Covered plants from herbicide drift (e.g., cover with plastic when spraying, or use a wick applicator).

   iii. Broadcast and power spray herbicide application is prohibited.

   iv. Ground-disturbing activities are prohibited within 5 feet of senesced annual and perennial plants, and within 10 feet of perennial plants. Ground disturbance should occur outside of the dripline of any woody species identified for avoidance.

PLANT-7*, Measures for When Effects Cannot Be Avoided.* If Covered plants cannot be avoided through the measures PLANT-1 through PLANT-6, the following measures will apply:

a. For species and critical habitat with an NLAA determination (Table 13), measures PLANT-1 through PLANT-6 (or alternate measures proposed by the Project Proponent) must be used to avoid adverse effects. If adverse effects cannot be avoided, separate consultation with the USFWS is necessary.

b. For species with an LAA determination (Table 13), limited, temporary adverse effects are allowed, consistent with the following measures. A site-specific restoration plan will be developed and implemented. This plan will be provided with the ESA Section 7(a)(2) Review Form for review and approval by the USFWS Field Office. The plan will demonstrate no net loss of habitat where presence is confirmed or assumed, number of individuals, genetic diversity, or habitat quality of the Covered Species occurrence. The restoration plan will include, at a minimum:

   i. No permanent loss of habitat will occur.

ii. Destruction of federally-listed plant individuals will be avoided to the extent feasible. In addition, this destruction will be restricted to 1% of the affected population, excluding impacts to the seedbank.

iii. Project proponents will summarize observations of and impacts to federally-listed plants during restoration activities and include them in the Post-Construction Report Form and any observed destruction of federally-listed plant species exceeding 1% of a population will be reported to the appropriate USFWS office within 72 hours.

c. Projects that would have permanent effects (e.g., permanent removal of vernal pool habitat) on Covered plant species will require separate, project-specific consultation.

PLANT-8*, Vernal Pool Plant Species Measures for Temporary Vernal Pool Habitat Impacts.* For temporary impacts to vernal pools with covered vernal pool plant species, the following measures will apply:

a. Minimize adverse effects to covered vernal pool plant species to the maximum extent practicable, not to exceed the self-imposed take limit of 10% per pool occupied by respective covered shrimp species. This can be addressed by only impacting portions of a vernal pool where the covered plant species is not present (by observation of a Qualified Biologist).

b. If adverse effects to covered vernal pool plant species are unavoidable, topsoil/inoculum will be collected, stored appropriately, and returned to the disturbed area of the vernal pool as soon as possible, once disturbance activities cease.

c. For those projects where the sole purpose of the impact is to restore ecological function to the vernal pool, with agreement of the respective USFWS Field Office, via the ESA Section 7(a)(2) Review Form process, the USFWS Field Office will work the Project Proponent to come up with additional minimization measures as needed.