California Wildfire Environmental Protection Plan

Prepared by:

California Environmental Protection Agency
California Natural Resources Agency
California Governor's Office of Emergency Services

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Contents

I. Environmental Protection Plan Overview

This document comprises the California Environmental Protection Plan (EPP) to support Phase II Disaster Debris and Hazard Tree Removal activities conducted by the state or local jurisdictions, pursuant to the Governor's Executive Orders (EO) and State of Emergency Proclamations (SOE), collectively, the EOs. The EOs (refer to Exhibit 1.0) may be coupled with Presidential Major Disaster Emergency Declarations by which the Federal Emergency Management Agency (FEMA) will be activated to assist the California Governor's Office of Emergency Services (Cal OES) to administer disaster response and recovery operations.

The EOs suspend State statutes, rules, regulations, and requirements that fall within the jurisdiction of boards, departments, and offices within the California Environmental Protection Agency (CalEPA) and the California Natural Resources Agency (CNRA) to the extent necessary for expediting the removal and cleanup of debris from fires or to address other impacts associated with that debris, among other emergency-related activities. **The suspensions and EPP are not self-executing**; a request must be made to the Agency Secretaries and approved before work can begin under the EOs. The emergency suspension authorizations (referred to herein as "Suspension Authorizations" or "Authorizations") are issued separately by Cal EPA and CNRA Secretaries that specify the suspended environmental laws and regulations, and requirements for a set of wildfire recovery activities.

The EOs require that emergency activities going forward under the suspensions be carried out in accordance with a plan that balances expeditious recovery with environmental protection. This EPP forms the basis for each Agency Secretary to authorize Phase II Disaster Debris and Hazard Tree Removal (DDHTR, or Debris Removal) activities conducted by State or local jurisdictions pursuant to the suspensions because it contains Best Management Practices (BMPs) to ensure that required environmental compliance is achieved and streamlined for such activities.

A. Purpose

The purpose of the EPP is to document how the DDHTR activities will be managed to comply with applicable environmental laws and regulations by implementing Post Fire Statewide Best Management Practices (BMPs) developed by Cal EPA, represented by the State Water Resources Control Board and Regional Water Quality Control Boards (Water Boards) and CNRA, represented by California Department of Fish and Wildlife (CDFW) and California Department of Forestry and Fire Prevention (CAL FIRE). In accordance with the EOs and each agency's statutory responsibilities, a document (Section II) was prepared jointly by these resource protection agencies to ensure Debris Removal activities can be expedited and conform to applicable resource laws and regulations.

In addition, this EPP recognizes that other state and federal agencies have regulatory responsibilities for natural and cultural resources within wildfire burn scars, including FEMA. The DDHTR activities as referred to herein, are referred to as Private Property Debris Removal (PPDR) activities by FEMA. Section III has been developed to enable compliance with federal agencies' jurisdictional authority as set forth in either FEMA or Cal OES consultation with federal resource agencies for which Avoidance and Minimization Measures (AMMs) have been defined, respectively, for federally declared or state proclaimed disasters.

This EPP is a living document that may be modified to apply to Debris Removal activities for additional seasonal wildfires; to add BMPs, defined by Cal EPA, CNRA, or other state and bi-state agencies (e.g., Tahoe Regional Planning Agency (TRPA)); or to add AMMs defined by FEMA for federally declared disasters, or by federal resource agencies at the request of Cal OES for state proclaimed disasters.[1]

B. Implementation

The EPP may be implemented by either state or local jurisdictions (e.g., city, towns, counties, or special districts) that have statutory obligations to do so. Entities conducting Debris Removal activities must coordinate with the appropriate Water Boards, CDFW, CAL FIRE, and bi-state agencies, as warranted. When local jurisdictions implement the EPP and conduct DDHTR activities, they must consult with the California Department of Resources Recycling and Recovery (CalRecycle) and Cal OES to ensure that the Suspensions have been authorized by Agency Secretaries, post construction reporting requirements will be undertaken, and contractors undertaking work have appropriate EPP training to do so and that EPP compliance is documented.

When Cal Recycle conducts DDHTR activities, consultation with Cal OES and coordination among responsible local and state jurisdictions is required to ensure that activities adhere to the EPP, which is designed to protect environmental and public health resources during Debris Removal operations. State resource agency contacts are contained in Exhibit 2.0.

C. Regulatory Agency Roles

The federal, state, and local agency roles and responsibilities for administering disaster recovery activities are summarized below.

1. Federal Agencies

The lead agency for federally declared major disasters, such as DR 4619 for the Caldor Fire (a 2021 Statewide Wildfires) is FEMA. Federally declared disasters are administered in accordance with the Robert T Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). FEMA conducts consultations with the U.S. Fish and Wildlife Service (USFWS) and National Oceanographic and Atmospheric Administration (NOAA)

[1] The TRPA is a bi-state agency (California and Nevada) that through the bi-state Tahoe Regional Planning Compact (Compact), reviews all activities undertaken within the Tahoe Basin that potentially affects its environmental quality.

National Marine Fisheries Service (NMFS) to address the application of federal Endangered Species Act Section 7 for Debris Removal activities. Through these consultations, AMMs will be defined to expedite disaster recovery activities for federally declared disasters that are associated with the Governor's EOs. In practice, the AMMs are the federal equivalent of the EPP BMPs and are expected to be based on FEMA's Programmatic Agreements with these agencies for disasters in California and are contained in Section III for reference. In the event that disaster recovery activities are being administered under a state emergency proclamation, the FEMA Programmatic Agreements may be utilized or substituted with disaster specific consultations by state or local agencies.

FEMA is also the lead agency for the National Historic Preservation Act (NHPA) Section 106 consultations for federally declared disasters (e.g., DR 4619) to address the protection of cultural resources and tribal consultations for which there is a Programmatic Agreement between FEMA, Cal OES and SHPO which is also contained in Section III.

2. State Agencies

This EPP is the principal document specifying Post Fire Statewide BMPs and was developed to streamline environmental compliance requirements to expedite disaster recovery in affected counties in accordance with EOs. If an EO does not stipulate that the Governor has suspended certain state statutes, laws, regulations, and requirements, or the agency has not obtained a Suspension Authorization from the CalEPA or CNRA Secretaries, this EPP does not apply and the lead entity for the disaster recovery activities is required to obtain all applicable state agency permits for work on non-federal lands.

If an EO stipulates that certain state statutes, laws, regulations, and requirements are temporarily suspended, and the Suspension Authorization has been granted, the EPP will apply and the lead entity (e.g., Cal Recycle) is obligated to implement it and document compliance with it. The state lead agency for disaster recovery is responsible for obtaining all applicable federal resource agency permits or conducting federal resource agency consultations required for Debris Removal activities on federal lands or *waters of the U.S. (WOTUS)* with the assistance of Cal OES.

3. Local Agencies

This EPP does not apply to Debris Removal activities for which local agency permits may be required for project support facilities, including, but not limited to contractor basecamps; temporary storage, pre-processing, and processing facilities; material laydown areas; temporary heliports and operation yards; and equipment maintenance yards. Local agencies will be responsible for administering the California Environmental Quality Act (CEQA) and California Planning and Zoning Laws when reviewing applications for construction or conditional use permits for these facilities.

Coordination with the local agencies is required to determine their permit requirements.

If an EO stipulates that certain state statutes, laws, regulations, and requirements are temporarily suspended, the EPP may apply, but only after obtaining a Suspension Authorization from the Cal EPA and CNRA Secretaries. The lead entity (e.g., city, town, county, or special district) may elect to implement and document compliance with it to receive public assistance grant funding from Cal OES and/or FEMA. The local agency will be required to request temporary suspensions from the Cal EPA and CNRA Agency Secretaries. Once received the local agency will need to ratify and return the Authorizations to the two agencies prior to work being performed in accordance with the EPP. The local lead agency for disaster recovery is responsible for conducting federal resource agency consultations and obtaining all other applicable federal resource agency permits for required for Debris Removal activities on federal lands or WOTUS in the event assistance in these efforts is not requested of Cal OES.

D. Agency Site Inspections

Any local, state, or federal agency has the right to inspect a work area (any portion of the burn area to which the EPP applies), consistent with a landowner's Fourth Amendment Rights. Rights of Entry (ROE) from private property owners are a prerequisite to a property being eligible for a state or county led Debris Removal program. When received, the disaster Incident Management Team (IMT) will keep the ROEs and record of debris removal activities in an electronic database. The database will be made available to regulatory agencies to understand what work is being conducted in their jurisdictional areas and decide if the activity would require their inspection or oversight.

1. Compliance

Prior to the commencement of Debris Removal activities, a training program will be delivered to contractors and consultants undertaking the work in accordance with. Section II, BMP 1.8 (Exhibit 2.1). Only those contractors and consultants that have completed the training will be allowed to work on active sites to ensure EPP compliance. Failure to comply with the AMMs and BMPs set forth in the EPP, and with any applicable federal and non-suspended state and local environmental laws and regulations, may result in an enforcement action by Cal EPA departments or boards and/or CNRA departments.

A matrix of principal federal and state environmental laws that may apply to the protected resources during Debris Removal activities is presented in Table 1.1 and summarized below. Any projects undertaken in compliance with this EPP must also comply with all applicable statutes, rules, regulations, and requirements not specifically identified as suspended in the relevant Suspension Authorizations.

a. *Federal Laws*

- Clean Water Act (CWA), including but not limited to Section 401 water quality certifications (Water Boards); Section 402 National Pollutant Discharge Elimination System (NPDES) permitting (Water Boards and United States Environmental Protection Agency (USEPA)); Section 404, fill and wetlands (U.S. Army Corps of Engineers (USACE)),
- Endangered Species Act (ESA, e.g., Section 7, USFWS, and the NMFS),
- Magnuson-Stevens Act (MSA), Migratory Bird Treaty Act (USFWS),
- Bald and Golden Eagle Protection Act (USFWS and CDFW),
- National Historic Preservation Act (e.g., Section 106), FEMA, California State Historic Preservation Officer (SHPO), and federally recognized tribes,
- Resource Conservation and Recovery Act (RCRA, e.g., Subtitle D - Non-Hazardous Waste for Timber and BioMass disposal; Subtitle C – Episodic Generator Provision, USEPA),
- National Emission Standards for Hazardous Air Pollutants (NESHAP), and
- National Environmental Policy Act (NEPA, FEMA).

b. *State Laws*

- Porter-Cologne Water Quality Act (California Water Code sections 13000 et seq., Water Boards),
- Endangered Species Act (California Fish and Game Code §2050-2115.5),
- California Fish and Game Code (CFGC) Section 1600 (e.g., Lake and Streambed Alteration Agreement), CDFW),
- California Fully Protected Birds (CFGC Section 3511, CDFW),
- California Migratory Bird Protection Act (CFGC Section 3513, CDFW),
- California Fully Protected Mammals (CFGC Section 4700, CDFW),
- California Fully Protected Reptiles and Amphibians (CFGC Section 5050, CDFW),
- California Fully Protected Fish (CFGC Section 5515, CDFW),
- California Clean Air Act (CCAA),
- California Native American, Historical, Cultural and Sacred Sites Act ('Sacred Sites Act', SHPO, and FEMA/Cal OES Tribal Liaison),
- E.O. B 10-11 (California Native Tribal Consultation),
- AB-52, Gatto. Native Americans CEQA Consultation,
- Z'berg-Nejedly Forest Practice Act (2022 California Forest Practice Rules (FPR), CAL FIRE)
- Native Plant Protection Act (CFGC Section 1900 et seq., CDFW), and
- Airborne Toxic Control Measure (ATCM) of 2007

Table 1.1 – Principal State and Federal Environmental Laws

	California Laws and Responsible Agencies			**Federal Laws and Responsible Agencies**		
Questions		**Yes**	**No**		**Yes**	**No**
	Clean Air Act - CARB/ AQMD			**Clean Air Act - US EPA**		
1	*Are there point and non-point sources?*	☐	☐	*Are there point and non-point sources?*	☐	☐
2	*Will friable hazardous or non-hazardous waste be transported that could become airborne?*	☐	☐	*Will friable hazardous or non-hazardous waste be transported that could become airborne?*	☐	☐
	Porter-Cologne Water Quality Act and FGC §1600 - SWRCB/RWQCB/CDFW			**Clean Water Act - USEPA and USACE**		
3	*Will be the potential for discharges to surface waters?*	☐	☐	*Will be the potential for discharges to surface waters?*	☐	☐
4	*What surface waters (including Waters of the State, or, U.S., or "wetlands" may need abatement/protection?*	☐	☐	*Will surface waters (including Waters of the U.S., or "wetlands") need abatement/protection?*	☐	☐
5	*Will action modify, divert, or obstruct existing surface waters?*	☐	☐	*Will action modify, divert, or obstruct existing surface waters?*	☐	☐
6	*Have potable water sources been or will be impacted?*	☐	☐	*Have potable water sources been or will be impacted?*	☐	☐
7	*Will action require bank stabilization, bridge, or culvert?*	☐	☐	*Will action require bank stabilization, bridge, or culvert?*	☐	☐
8	*Will action require repair, replacement of structure or fill adjacent to surface waters?*	☐	☐	*Will action require repair, replacement of structure or fill adjacent to surface waters?*	☐	☐

	Endangered Species Act/ California Fish and Game Code - CDFW			**Endangered Species Act - USFWS/ NMFS**		
Questions		**Yes**	**No**		**Yes**	**No**
9	*Will action require removal of riparian vegetation?*	☐	☐	*Will action require removal of riparian vegetation?*	☐	☐
10	*Will action affect protected fish and wildlife and/or habitats?*	☐	☐	*Will action affect protected terrestrial or aquatic species and/or habitats?*	☐	☐
11	*Are there wildlife enhancement, attraction, or harvesting devices are included in the action?*	☐	☐	*Are there wildlife enhancement, attraction, or harvesting devices are included in the action?*	☐	☐
	Migratory Bird Protection Act - CDFW			**Migratory Bird Treaty Act/ Bald and Golden Eagle Protection Act - USFWS**		
12	*Will action affect protected avian species and/or habitats?*	☐	☐	*Will action affect protected avian species and/or habitats?*	☐	☐
	California Superfund - DTSC/ Cal Recycle			**Resource Conservation and Recovery Act - USEPA**		
13	*Will hazardous (e.g., chemical) or non-hazardous (e.g., vegetative debris) waste be removed?*	☐	☐	*Will hazardous (e.g., chemical) or non-hazardous (e.g., vegetative debris) waste be removed?*	☐	☐
	Forest Practice Act (Non-Federal Lands) - CAL FIRE			**National Forest Practices Act (Federal lands) - USDA/USNFS**		
14	*Will disaster-impacted trees be removed using a Timber Harvest Plan (THP) or Forest Practice Exemption??*	☐	☐	*Will disaster-impacted trees be removed using a Timber Harvest Plan?*	☐	☐

	California Native American Historic Resources Protection Act -NAHC			National Historic Preservation Act - FEMA/SHPO		
Questions		**Yes**	**No**		**Yes**	**No**
15	*Do archaeological or cultural resources, relics, or human remains exist or could they be disturbed?*	☐	☐	*Do archaeological or cultural resources, relics, or human remains exist or could they be disturbed?*	☐	☐
16	*Not Applicable, refer to federal law/agencies question.*	☐	☐	*Are structures 50 years old or older impacted?*	☐	☐
	California Coastal Act - CCC			**Coastal Zone Management Act**		
17	*Is the action located in the California Coastal Zone?*	☐	☐	*Is the action in the California Coastal Zone and is a Certificate of Consistency required?*	☐	☐
	California Environmental Quality Act - State and Local Agencies			**National Environmental Policy Act - Federal Agencies**		
18	*Does the action qualify for Statutory Exemption (Emergency Project, CEQA 15269)? Submit Notice of Exemption (per CEQA 15062).*	☐	☐	*Does the action qualify for a Categorical Exclusion? The CEQ list of Federal Agencies' Categorical Exclusions which is accessible from the following link: https://ceq.doe.gov/nepa-practice/categorical-exclusions.html*	☐	☐
20	*Does the action have significant Effects on the Environment (submit CEQA documents)?*	☐	☐	*Does the action have significant Effects on the Environment (submit NEPA documents)?*	☐	☐

Note: Blue line indicates variations in state and federal laws.

Exhibit 1.0: Wildfire Executive Orders and Emergency Proclamations

II. State Resource Agency Best Management Practices

This section comprises the Best Management Practices (BMPs) developed by the:

- California Environmental Protection Agency (Cal EPA)
  - State Water Resources Control Board and Regional Water Quality Control Boards (Water Boards)
- California Natural Resources Agency (CNRA)
  - Department of Fish and Wildlife (CDFW) and
  - Department of Forestry and Fire Protection (CAL FIRE).

Each BMP is numbered and followed by information in parentheses that identifies which agency or agencies should be contacted if there are questions about that BMP. Water Boards is abbreviated WB, and the California Department of Fish and Wildlife is abbreviated CDFW. Definitions for italicized terms in the EPP BMPs may be found in Exhibit 2.2.

A Quick Reference Guide is provided to help identify which sections of the EPP apply to specific activities. Please refer to Table 2.1 of the Quick Reference Guide, Part 1 to see which sections of the EPP apply, and Table 2.2 Quick Reference Guide, Part 2 to see what the titles of the BMPs in each section are, to help determine BMP applicability. It should be noted that even where the California Forest Practice Rules do not apply because timber operations are not being conducted, in certain instances specified in the EPP the Forest Practice Rule standards will be relied upon to ensure resource protection. Questions should be directed to the appropriate state resource agency contacts who are identified in Exhibit 2.0

Table 2.1: Quick Reference Guide, Part 1 – Environmental Protection Plan Provisions

DDHTR or PPDR Activity	1. Project Planning BMPs	2. Pollution Prevention & Equipment Storage	3. Sediment & Erosion Control	4. Vegetation and Tree Removal	5. Watercourse Crossing and Bank Stabilization	6. Water Drafting and In-Water Work	7. Drinking Water Operations Coordination	8. Fish and Wildlife Protection
Watercourse Crossing above ordinary high-water mark	X	X	X		X	X		X
Ford Crossings	X	X	X		X	X		X
Construction, Maintenance, and/or Use of Forest Roads, Skids Trails, Landings	X	X	X	X	X			X
Work within Watercourse and Lake Protection Zone	X	X	X		X	X		X

DDHTR or PPDR Activity	1. Project Planning BMPs	2. Pollution Prevention & Equipment Storage	3. Sediment & Erosion Control	4. Vegetation and Tree Removal	5. Watercourse Crossing and Bank Stabilization	6. Water Drafting and In-Water Work	7. Drinking Water Operations Coordination	8. Fish and Wildlife Protection
Staging Area Development	X	X	X	X	X		X	X
Hazardous and Non-Hazardous Waste Generating Activities	X	X	X					X
Equipment Operation, Maintenance, Fueling	X	X						
Tree Felling and Removal	X	X	X	X		X		X
Structural Debris Removal	X	X	X				X	X
Water Drafting	X	X	X			X	X	X

Table 2.2: Quick Reference Guide, Part 2- Environmental Protection Plan by Section

Section 1 – Project Planning

1.1 (WB & CDFW) In-Water Work Federal Compliance

1.2 (WB) Federal Clean Water Act Permitting

- 1.2.1 Construction Stormwater Permit Coverage
- 1.2.2 Industrial Stormwater Permit Coverage

1.3 (WB & CDFW) Spill Response Plan

1.4 (WB & CDFW) Consultation

1.5 (CDFW) Qualified Biologist

1.6 (WB & CDFW) Site Assessments

- 1.6.1 (CDFW) Fire-Specific Measures
- 1.6.2 (CDFW) Sensitive Habitats and Land Types

1.7 (WB & CDFW) Watercourse Classification

1.8 (WB & CDFW) Pre-Project Education

1.9 (WB & CDFW) Reasonable Access for Inspection

Section 2 – Pollution Prevention and Equipment Storage

2.1 (WB) Non-Degradation

2.2 (WB & CDFW) Hazardous Materials

2.3 (CDFW) Invasive Species Prevention

2.4 (WB & CDFW) Sawdust and other non-hazardous wastes

2.5 (WB & CDFW) Debris and Trash Management

2.6 (WB & CDFW) Trenching / Excavation /Grading Spoils

2.7 (WB & CDFW) Operating Equipment and Vehicle Leaks

2.8 (WB & CDFW) Equipment Maintenance and Fueling

2.9 (WB & CDFW) Pesticides

Section 3 – Sediment and Erosion Control

3.1 (WB & CDFW) Sediment and Erosion Control Measures

3.2 (WB) Ground disturbance and creation of areas bare of vegetation

3.3 (WB & CDFW) Long-Term Erosion Control

3.4 (WB & CDFW) Saturated Soil Conditions

3.5 (WB & CDFW) Adequate Erosion Control Materials Onsite

3.6 (WB) BMP Implementation Inspection

Table 2.2: Quick Reference Guide, Part 2- Environmental Protection Plan by Section (cont.)

3.7 (WB) Road Maintenance

3.8 (WB & CDFW) Road and Landing Construction

3.9 (WB & CDFW) Stabilize and Inspect Decommissioned/Deactivated and Abandoned Roads

3.11 (WB) Drop Inlets

Section 4 – Vegetation and Tree Removal

4.1 (CDFW) Special-Status Botanical Species

4.2 (WB & CDFW) Vegetation Removal

4.3 (WB & CDFW) Revegetation Requirements

4.4 (WB & CDFW) Commercial and Non-Commercial Tree Removal

4.5 (WB & CDFW) Tree Retention

Section 5 – Watercourse Crossing and Bank Stabilization

5.1 (WB & CDFW) New Permanent Watercourse Crossings

5.2 (WB & CDFW) Temporary Watercourse Crossings

5.3 (WB & CDFW) Temporary Crossing Fill Materials

5.4 (WB) Damaged Watercourse Crossing Structures

5.5 (WB & CDFW) Watercourse Bank Stabilization

5.6 (WB & CDFW) Removal of Watercourse Crossings

Section 6 – Water Drafting and In-Water Work

6.1 (WB & CDFW) Use of Low Water Crossings and/or Fords

6.2 (WB & CDFW) Water Drafting

Section 7 – Drinking Water Operations Coordination

7.1 (WB) Coordination

7.2 (WB) Coordination with area involved water systems

7.3 (WB) Use of Water

7.4 (WB) Water Meters

7.5 (WB) Damage to Water Facilities

7.6 (WB) Temporary Debris Storage

7.7 (WB) Water System Infrastructure

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Table 2.2: Quick Reference Guide, Part 2- Environmental Protection Plan by Section (cont.)

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8.6 (CDFW) Snake Avoidance

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9.2 Notice of Emergency Operations (CCR 1052):

9.3 Location and Classification of All Watercourses:

9.4 In Lieu Practices

Section 1: Project Planning

1.1 (WB & CDFW) In-Water Work Federal Compliance: When project activities will require working within watercourses, installing temporary access through watercourses, and/or removal or placement of materials within the bed, bank, or channel of watercourses, the project proponent must ensure they are complying with federal notification and permitting requirements.

1.2 (WB) Federal Clean Water Act Permitting: Construction and operation of staging areas and processing sites may require Construction General Permit (CGP) and/or Industrial General Permit (IGP) Stormwater Permits issued by the appropriate Regional Water Board. Permit type and permitting requirements are determined based on site-specific characteristics and proposed use. Work requiring coverage under waste discharge requirements, or a water quality certification issued by the Water Boards that is not otherwise within the scope of an approved Agency Secretary Environmental Suspension may not begin until such coverage is obtained. National Pollution Discharge Elimination System (NPDES) permitting requirements cannot be suspended and may apply to debris or hazard tree removal activities. Please contact the appropriate Regional Water Board to determine CGP and IGP applicability.

1.2.1 CGP Coverage: Coverage under the State Water Resources Control Board's General Permit for Discharges of Stormwater Associated with Construction Activity, Order 2009-0009-DWQ (Construction General Permit, CGP) is required when a project creates a soil disturbance of one acre or more. Coverage is also required for projects with less than one acre of soil disturbance that are part of a larger plan of development that collectively disturbs one acre or more. Construction activity that may be subject to this permit includes clearing, grading, grubbing, or excavation, but does not include routine maintenance activities performed to restore the original line, grade, or capacity of a facility. Road construction activities that expose the underlying soil or erodible subgrade is not considered routine maintenance and may be subject to enrollment in the CGP.

1.2.2 IGP Coverage: Coverage under the State Water Resources Control Board's General Permit for Stormwater Discharges Associated with Industrial Activities, Order 2014-0057-DWQ (Industrial General Permit, IGP) may be required when a project includes certain industrial activities. In the case of post-fire debris removal and hazard tree removal, these could include but are not limited to:

- Scrap and waste materials storage;
- Sorting and handling of soil, concrete, metals, vehicles, wood, and vegetation;
- Log storage and handling associated with chipping, grinding, or sawmilling; and
- Maintenance of vehicles and equipment.

1.3 (WB & CDFW) Spill Response Plan: Prior to the start of project activities, a spill response plan should be prepared that identifies how hazardous materials will be stored and removed from the site, and the actions to be taken in the event of spill of concrete, petroleum products, sediment, or other hazardous material. The plan should:

- Reference the California State Oil Spill Contingency Plan
- Identify the steps to be followed in the event of a spill
- Have clear instructions on immediate reporting
- Identify the emergency response materials which will be kept at the project site to allow the rapid containment and clean-up of any spilled material

If a spill occurs, notifications should be made within 48 hours to the Regional Water Board and CDFW contacts (See Attachment 5) in addition to the following contacts:

- California State Warning Center - (800) 852-7550 or (916) 845-8911.
- Federal – National Response Center - (800) 424-8802 or (202) 267-2675.
- Local Government - 911 or other designated local number.

1.4 (WB & CDFW) Consultation: It is imperative to consult with the Water Boards and CDFW early in the site assessment phase to ensure certain planned activities will be in compliance with the EPP and:

- Are within the scope of the EPP.
- Will have adequate water quality BMPs in use.
- Will have adequate habitat and species-specific Performance Measures for the project.

Consultation means at minimum, notification of planned activities through the SmartSheets system or other notification method. A meeting to calibrate consultation needs should occur during the site assessment phase.

If project activities will occur in or near sensitive habitat, project proponent should consult with the CDFW Contact and the qualified biologist or Task Force Leader (TFL) to ensure the habitat is clearly marked and avoided during project activities. If aspects of the project may cause impacts to sensitive habitat(s), such as waterbodies that contain anadromous fish species or a domestic or municipal water supply, then all feasible measures should be taken to avoid such impacts. Please reach out to the appropriate Regional Water Board and CDFW Contact as necessary to consider feasible project alternatives and/or environmental impact avoidance measures.

1.5 (CDFW) Qualified Biologist: When selecting a qualified biologist, the biologist should hold a wildlife biology, botany, ecology, forestry, or other relevant degree from an accredited university and: 1) be knowledgeable in relevant

species life histories and ecology, 2) be able to correctly identify relevant species and habitats, 3) have experience conducting field surveys of relevant species or resources, 4) be knowledgeable about survey protocols, 5) be knowledgeable about state and federal laws regarding the protection of special-status species, and 6) have experience with CDFW's California Natural Diversity Database (CNDDB) and Biogeographic Information and Observation System (BIOS). The project proponent will review the resume and ensure the above qualifications of the biologist are met prior to beginning work. If species-specific protocol surveys are performed, surveys will be conducted by the qualified biologist with the minimum qualifications required by the appropriated protocols, including having CDFW or USFWS approval to conduct such surveys if required by certain protocols. If the size of the project warrants more than one qualified biologist, one of the qualified biologists should be designated the lead qualified biologist and be the primary point of contact for the biological elements of the project.

1.6 (WB & CDFW) Site Assessments: During the initial site assessments conducted by Cal OES, CalRecycle, and its contractors, or the county and its contractors, the task force leader (TFL) or other qualified persons should survey the work area using the site assessment checklist (See Exhibit 2.3) to identify things to include but not limited to where work within the watercourse and lake protection zone (WLPZ) may occur, the location of any watercourses, 100-year floodplains, and staging areas, where operators plan to cross a watercourse, how many times they estimate they will cross, and what method of crossing will be used.

Additionally, the qualified biologist or TFL should survey the work area to identify if wildlife resources are present, and then determine if CESA-listed or special-status fish, wildlife, or plant species are active on the site. If wildlife resources such as nests, nest cavities, roosts, roost trees, or dens are present, the qualified biologist should determine if those resources are actively being used. When project activities are proposed within the wetted portion of a watercourse or lake margin, the qualified biologist or TFL should survey the area prior to the start of project activities to determine if aquatic, terrestrial or amphibian wildlife resources, such as reeds or spawning gravel beds, are present within proposed watercourse crossings and may be impacted by project activities. When fish and wildlife resources within the work area are actively being used, the qualified biologist or TFL should refer to Section 8 on how to proceed.

1.6.1 (CDFW) Fire-Specific Measures: During the site assessment the Operations Chief, Debris Group Supervisor, or their designee should reference the most current version of Exhibit 2.4 CDFW 2024 Wildfires Habitats and Special Status Species Impacted by Fire Name, Watershed, and County, and CDFW Species-Specific Measures. This document contains fire-specific habitat and species impact information and additional species-specific BMPs for use during project activities. Contact the appropriate CDFW Contact for the most current version.

1.6.2 (CDFW) Sensitive Habitats and Land Types: During the site assessment sensitive habitats and land types should be identified in consultation with the qualified biologist and by referencing the most current version of Exhibit 2.2. Before the start of project deployment, the project site should be visually inspected for wet meadows, vernal pools, areas with biological crusts, pebble plains, quartz deposits (in arid habitats), desert pavement, etc. These areas are extremely sensitive to any disturbance including foot traffic and should be marked with exclusion fencing or similar methods and avoided.

If project logistics necessitate entry into these habitat types, consultation between the CDFW Contact and the Operations Chief, Debris Group Supervisor, or designee for additional site-specific measures should occur prior to any entry into those habitats. Additional measures could include, but are not limited to, seasonal avoidance, transplanting, and reseeding.

1.7 (WB & CDFW) Watercourse Classification: Where the CAL FIRE Forest Practice Rules do not apply, the Watercourse and Lake Protection Zone (WLPZ) classifications and minimum width standards excerpted from the FPRs in the table below will nevertheless be utilized under this EPP. Please refer to Table 1 below to designate a WLPZ width for each side of a classified watercourse in those work areas in which watercourses are identified during site assessments.

Table 2.3: Watercourse and Lake Protection Zone (WLPZ) where FPRs do not apply

Water Class Characteristic for Use in Classification	Domestic water source or fish always or seasonally present	Fish always or seasonally present within 1,000 feet downstream and/or aquatic habitat for non-fish aquatic species	No aquatic life present. Watercourse capable of sediment transport to Class I and II waters under normal high water flow conditions	Man-made watercourse
Slope (Percent)	**Class I**	**Class II**	**Class III**	**Class IV**
<30	75 feet	50 feet	50 feet	50 feet
30-50	100 feet	75 feet	75 feet	75 feet
>50	150 feet	100 feet	100 feet	100 feet

1.8 (WB & CDFW) Pre-Project Education: There should be a pre-project training program for all employees, contractors, and personnel working within the

project site prior to performing any work. The program should be approved by the agency representatives and consist of a presentation from a qualified person that includes a discussion of:

- What the EPP is, what it represents, and how to use the EPP,
- Consequences for not acting in compliance with the EPP and all applicable statutes and regulations,
- What nonpoint source pollution (NPS) is, and how the different recovery activities can create NPS pollution if not properly mitigated,
- What properly executed BMPs look like while conducting these activities,
- Definitions of "Waters of the United States," "Waters of the State," and other relevant terms that may need to be defined,
- The Federal Clean Water Act NPDES permitting and US Army Corps of Engineers 404 permitting, and when it may be required,
- The biology of the habitats and special-status species identified during the site assessments as present or that have the potential to be present on the project site,
- Information about the distribution and habitat needs of any special-status species that may be present and project-specific protective measures included in the EPP, and
- How a site should look before being signed off and returned.

When new employees, contractors, and personnel are deployed mid-project the pre-project education will be given prior to the new employees, contractors, and personnel prior to beginning work on-site. Interpretation should be provided for non-English speaking employees, contractors, or personnel prior to their performing any work at the project site. A handout that summarizes the education program including guidance documents and graphics should be provided to the contractors.

1.9 (WB & CDFW) Reasonable Access for Inspection: Reasonable access to the property should be provided whenever requested by California Water Boards and/or CDFW staff for the purpose of performing inspections and conducting monitoring, including sample collection, measuring, and photographing/taping to determine proper implementation of management practices as described in the Environmental Protection Plan. Management practices and water quality protective measures recommended by Regional Water Board or CDFW staff as a result of such inspections should be incorporated into the project where feasible and appropriate.

Section 2: Pollution Prevention and Equipment Storage

2.1 (WB) Non-Degradation: Neither this Environmental Protection Plan (EPP) or the Secretarial Suspension authorizes activities that will cause or threaten to cause discharges of waste to waters of the state in a manner that creates pollution.

2.2 (WB & CDFW) Hazardous Substance: Materials such as debris, ash, rubbish, creosote-treated wood products, raw cement/concrete, or washings thereof, asphalt, pesticides, paint or other coating material, petroleum products, and batteries can be hazardous to aquatic life, wildlife, or riparian habitat. Hazardous substances associated with project related activities should be handled, transported, and stored in a manner that prevents materials from contaminating underlying soils and/or entering any watercourse by either being removed daily or stored in watertight containers onsite until removed. *Hazardous substances* should not be stored in floodplains.

2.3 (CDFW) Invasive Species Prevention. All contractors should follow guidelines in the California Invasive Plant Council's Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers (Cal-IPC 2012) (https://www.cal-ipc.org/docs/bmps/dd9jwo1ml8vttq9527zjhek99qr/BMPLandManager.pdf) to prevent the spread of invasive plant species. Equipment should be cleaned of material that may harbor invasive plant seeds or invasive pests before starting a new project in a different watershed or fire boundary. This material includes soil or plant seeds on construction equipment, tools, boots, and clothing.

2.4 (WB & CDFW) Sawdust and other non-hazardous wastes: Sawdust, soil, silt, clay, rock, felled trees, slash, bark, and ash should be controlled in such a manner that it does not enter a watercourse in amounts that could adversely impact water quality and/or aquatic resources and, where feasible, should not be stored within 25 feet of a watercourse, or within a *floodplain*.

2.5 (WB & CDFW) Debris and Trash Management: No litter, raw materials or waste and construction debris should be deposited within or next to a watercourse bed, bank, or channel or lake margin, within a *floodplain*, or anywhere it may pass into a watercourse or lake. All raw construction materials and waste debris from the project site following the completion of work should be removed as soon as possible. All trash cans and dumpsters should remain covered except when in use and covered at the end of each workday, and food waste should be removed daily to avoid attracting wildlife to the project site.

2.6 (WB & CDFW) Trenching / Excavation /Grading Spoils: As required by an applicable permit, castings or spoils from the trenching / excavation operations should be placed in a location where it cannot enter a watercourse and will have erosion control measures applied.

2.7 (WB & CDFW) Operating Equipment and Vehicle Leaks: Equipment should not be stored within a WLPZ or a *floodplain*, to the extent feasible. Any equipment or vehicles driven, operated, or otherwise adjacent to a WLPZ, *floodplain*, or

riparian habitat should be checked and maintained daily to prevent leaks of materials that could be harmful to aquatic life or riparian habitat. Stationary equipment such as motors, pumps, generators, and welders, located in or adjacent to the stream/lake should be positioned over drip pans.

2.8 WB & CDFW) Equipment Maintenance and Fueling: All equipment maintenance, fueling, and storage should occur in staging, storage, or parking areas. No equipment maintenance, fueling or storage will occur within or adjacent to, any watercourse channel, wetland, floodplain, or lake margin where petroleum products or other pollutants from the equipment may be mobilized by stormwater runoff or otherwise enter these areas.

2.9 (WB & CDFW) Pesticides: Use of any type of *pesticides* is prohibited.

Section 3: Sediment and Erosion Control

3.1 (WB & CDFW) Sediment and Erosion Control Measures [Note: Forest Practice Rule (FPR) standards for timing of erosion control structure installation apply as specified below]: Biodegradable sediment and erosion control measures will be utilized throughout all phases of operation where soil, trenching spoils and casting, and sediment runoff from work areas threatens to enter receiving waters. Erosion control structures should be installed on all constructed skid trails and tractor roads and other applicable work areas prior to the end of the day if the U.S. Weather Service forecast is a "chance" (30% or more) of rain before the next day, and prior to weekend or other shutdown periods per FPRs 914.7, 934.7, 954.7 (c)(2). Additionally, sediment and erosion control BMPs should be inspected (before and after the event) and repaired, upgraded, and maintained to prevent sediment-laden runoff. Maintenance includes, but is not limited to:

- Checking for trapped or entangled fish and wildlife,
- Removal of accumulated sediment, and
- Replacement of damaged silt fencing, compost socks, coir logs, coir rolls, and/or straw bale dikes.

Modifications, repairs, and improvements should be made to the sediment and erosion control measures whenever warranted. Materials used in the sediment barriers should not pose an entanglement risk to fish or wildlife (e.g., plastic monofilament netting).

Where vegetation cannot reasonably be expected to become established and erosion control measures are intended for more than one season (more than three months), the materials used should consist of biodegradable materials. For example, tacked-down jute erosion control blankets, coconut fiber matting, and other soil stabilization methods should be used. Broadcast straw and chipped mulch is acceptable on soil with less than 10% slope and in areas that are not exposed to wind and must be applied so the layer remains intact long enough for vegetation to become established.

3.2 (WB) Ground disturbance and creation of areas bare of vegetation: Work should be planned to minimize ground disturbance activities and to prevent discharge of sediment to receiving waters. Generally, where ground disturbance is larger than one acre, a Stormwater Construction General Permit may be required; see BMP 1.2 above.

3.3 (WB & CDFW) Long-Term Erosion Control: Incorporate long-term erosion control measures such as water breaks, rolling dips, bio-filtration strips, and biodegradable wattles to the maximum extent feasible to hydrologically disconnect drainage features from receiving waters. This includes but is not limited to any work sites, staging areas, processing areas, logging/hazard tree removal operations areas, and/or roads and trails used during operations.

3.4 (WB & CDFW) Saturated Soil Conditions: Operations will be limited or halted when *saturated soil conditions* are present as determined by the Operations Chief or RPF. Per Forest Practice Rules (FPR) section 895.1 definitions, "*Saturated Soil Conditions*," means that soil and/or surface material pore spaces are filled with water to such an extent that runoff is likely to occur. Indicators of Saturated Soil Conditions may include but are not limited to:

- Areas of ponded water,
- Pumping of fine soil particles from the soil or road surfacing material during Timber Operations,
- Loss of bearing strength resulting in the deflection of soil or road surfaces under a load, such as the creation of wheel ruts,
- Spinning or churning of wheels or tracks that produces a wet slurry, and
- Inadequate traction without blading wet soil or surfacing materials.

Where FPRs do not apply, FPR standards identified in these BMPs apply under this EPP and operations should still be limited or halted in *saturated soil* conditions as defined Exhibit 2.2, EPP Definitions, because working in saturated soils has the potential to create *significant sediment discharge*.

3.5 (WB & CDFW) Adequate Erosion Control Materials Onsite: Prior to any ground disturbing work at a project site, erosion control materials (such as, fiber rolls, bonded fiber matrix, erosion control mats, soil tackifiers) should be stockpiled on site in a nearby staging area. These materials should be protected from the elements while they are stored at staging areas.

3.6 (WB) BMP Implementation Inspection: Prior to completing operations at a project site and returning the right-of-entry, a BMP implementation inspection should occur in work areas with erosion potential and sediment discharge potential, and the final site walk checklist should be completed (see Exhibit 2.5).

An implementation inspection consists of detailed visual inspections to verify BMPs are properly applied in accordance with EPP measures, and that any

water quality protective measures identified by Water Boards staff during site inspections were properly implemented.

3.7 (WB) Road Maintenance [Note: Forest Practice Rule standards apply as specified]: During operations, road running surfaces in the work area should be treated as necessary to prevent excessive dust and loss of road surface materials by implementing methods including but not limited to, rocking, watering, paving, chemically treating, or installing commercial erosion control devices to manufacturer's specification. Please refer to FPRs 923.7, 943.7, 963.7(c).

3.8 (WB & CDFW) Road and Landing Construction [Note: Forest Practice Rule standards apply as specified]: Per FPRs 923.4, 943.4, 963.4, roads and landings should be hydrologically disconnected from watercourses and lakes to the extent feasible to minimize sediment delivery from road runoff and reduce the potential for hydrologic changes. To the extent feasible, roads and landings should **not** be constructed:

- Within 150 feet of a Class I Watercourse,
- Within 100 feet of a Class II Watercourse on slopes of greater than 30%,
- Within any WLPZ, and
- Within marshes, wet meadows, and other wet areas.

If a road or landing must be built in one of these areas, notification to the appropriate Regional Water Board contact should be made during the site assessment phase of operations.

Temporary roads should be restored to pre-operation conditions upon completion of work, and permanent roads should be properly stabilized and/or decommissioned. Please refer to BMP 3.9 (below).

3.9 (WB & CDFW) Stabilize and Inspect Decommissioned/Deactivated and Abandoned Roads: Decommissioning/deactivation/abandonment of roads should be conducted in a manner that ensures stabilization and a return to its previous state. If the National Weather Service Forecast is a "chance" (30% or more) of rain within the next 24 hours, sediment and erosion control structures should be installed before sunset and inspected after the rain event.

Areas exhibiting erosion with the potential to transport sediment to receiving waters should be repaired with applicable BMPs, unless reentering the site would cause greater damage than leaving the ineffective stabilization measures. If repairs are made, they should be inspected following any precipitation event which lead to soils becoming saturated and producing runoff.

Barricades should be constructed at all points of access to the decommissioned, deactivated, or abandoned road to effectively prevent use by any passenger vehicle, off road vehicle or other equipment.

3.11 (WB) Drop Inlets: Protect drop inlet structures near work areas. Drop inlets should be protected with an appropriately sized inlet filter bag or other BMPs that prevent sediment from entering the drop inlet. The drop inlet BMPs should be inspected and maintained on a frequent basis.

Section 4: Vegetation and Tree Removal

4.1 (CDFW) Special-Status Botanical Species. Avoid impacts to rare plant species by identifying areas with rare plants during the appropriate blooming season and establishing work season buffers. If rare, threatened, or endangered plant species are found during operations a 10-foot radius equipment exclusion buffer should be placed around the population. If trees are to be harvested within the buffer, trees should be felled away from the core plant populations if feasible. If avoidance is not possible, the Operations Chief, Debris Group Supervisor, or designee should consult with the CDFW Contact for additional site-specific measures.

4.2 (WB & CDFW) Vegetation Removal: Disturbance or removal of vegetation should be kept to the minimum necessary to complete project related activities. All trimmed or cleared material and/or vegetation should be either removed from the area or deposited where it cannot re-enter the watercourse or lake margin.

4.3 (WB & CDFW) Revegetation Requirements: If required because of agency consultation, or by an applicable Construction Stormwater permit, disturbed areas should be revegetated with native species suitable to the restoration activity; an example when this may be required is when decommissioning an access road leading to a temporary crossing. (See NMFS-9b, Attachment 3).

4.4 (WB & CDFW) Commercial and Non-Commercial Tree Removal [Note: Forest Practice Rules apply as specified]: Trees being removed for commercial purposes must adhere to the FPRs, and project proponents should consult with a Registered Professional Forester (RPF). Please see the FPR 895.1 definitions for commercial species.

Trees being removed for non-commercial purposes should be evaluated by a certified arborist or RPF. The evaluation should determine the viability of trees marked for removal before tree removal activities begin. If possible, retain large snags, trees with basal hollows or cavities, trees with limbs greater than 6-inches in diameter, old-growth trees, stand-alone granary trees, or other trees with features providing valuable habitat where no immediate risk to public safety and/or infrastructure exists.

To the fullest extent possible and with due consideration given to topography, lean of trees, landings, utility lines, local obstructions, and safety factors, as further described in FPR sections 914.1, 934.1, and/or 954.1, trees should be felled in a manner that avoids bridging watercourses unless approved by the appropriate Regional Water Board and CDFW as part of an approved aquatic habitat restoration project; approved as an in-lieu practice in an Emergency

Notice (FPR section 1051) by CAL FIRE; and, with concurrence of the appropriate Regional Board, CDFW, and CAL FIRE, where access to both sides of a watercourse does not exist, and/or where potential impacts to a WLPZ would be minimized through cross-falling of trees.

In the event trees cannot be jacked and/or pulled away from a watercourse, they are not part of a habitat restoration project, and cross-falling has been approved, the felled tree(s) and any associated debris and soil deposited in the channel should be removed as soon as possible, and disturbed soils stabilized through appropriate measures thereafter.

CDFW and the Regional Water Boards should be consulted when questions arise about work in habitats with *anadromous fish* that deviates from the general prescriptions of the EPP; CDFW should be contacted when questions arise regarding potential impacts to listed or other wildlife habitat features.

4.5 (WB & CDFW) Tree Retention [Forest Practice Rule standards apply as specified]: For both commercial and non-commercial tree removal, trees within the riparian zone that are not deemed a hazard to public safety and/or infrastructure should be retained in areas with anadromous salmonid habitat to the maximum extent practicable to support future natural recruitment and add to the aquatic habitat complexity. Operators should comply with FPR sections 916.4, 936.4, 956.4 for watercourse and lake protection; and 916.9, 936.9, and/or 956.9 for protection of watercourses in watersheds with listed anadromous salmonids. Please consult with the appropriate Regional Water Board, CDFW, and CAL FIRE contacts if there are questions about tree retention within or adjacent to salmonid habitats.

Section 5: Watercourse Crossing and Bank Stabilization

[Note: Forest Practice Rule standards apply as specified.]

5.1 (WB & CDFW) New Permanent Watercourse Crossings: These BMPs are not intended to be utilized for permanent replacement of watercourse crossings and other in-water infrastructure, such as culverts, that have been destroyed. Contractors should consult with the US Army Corps of Engineers, CDFW, and appropriate Regional Water Board before any new permanent watercourse crossing, staging area, or processing area is constructed, or when an existing watercourse crossing requires repair, in or adjacent to a Water of the United States and/or Waters of the State.

Should construction of permanent watercourse crossings be necessary, the contractor should consult with the appropriate Regional Water Board and CDFW in advance to develop a strategy for compliance with non-Suspension Authorization regulatory requirements. At a minimum, permanent watercourse crossings should be designed and constructed to accommodate the estimated 100-year flood flow, including debris and sediment loads (considerations are outlined in FPR sections 923.9, 943.9, 963.9, and Designing Watercourse Crossings

for Passage of 100-Year Flood Flows, Wood, and Sediment (Updated 2017 by Cafferata et al).

5.2 (WB and CDFW) Temporary Watercourse Crossings: If an existing or temporary watercourse crossing must be used, the crossing site should be clearly marked with signage or flagging, and sediment and erosion control methods should be implemented to minimize impacts within the WLPZ.

As feasible, *temporary watercourse crossings* should be installed and removed outside of the winter period, installed, and used when water is not flowing, and removed and stabilized immediately after debris and/or hazard tree removal work has been completed. In the event a temporary watercourse crossing must be used during the winter period it should either be designed and constructed to accommodate the estimated 100-year flood flow, including debris and sediment loads, or should be removed prior to sunset if the National Weather Service Forecast is a "chance" (30% or more) of rain within the next 24 hours.

All bare mineral soil exposed in conjunction with crossing construction, deconstruction, maintenance, or repair, should be treated for erosion immediately upon completion of the crossing work, and prior to the onset of precipitation capable of generating runoff. Erosion control BMPs should be used to stabilize the approaches and banks of the watercourse. If the site is seeded, native species or a sterile seed mix and mulch should be used to the extent feasible.

The site should also be inspected for fish, wildlife, and special-status plant species prior to use. When fish and/or wildlife is found within the crossing location, refer to BMP 8.4 on how to proceed. No temporary crossings should be constructed where flow and aquatic species passage is obstructed during the period of use.

5.3 (WB & CDFW) Temporary Crossing Fill Materials: To minimize turbidity or siltation in receiving waters, temporary crossings should be constructed with washed 2–6-inch pit run rock, screened river gravels, washed 2-inch plus rock or gravel, and/or logs in fill materials whenever feasible. Bridge abutments below the ordinary high-water mark should be rock. Where a temporary crossing using fill material is removed, the channel shape and gradient should be returned to pre-project condition and stabilized to the extent feasible; any adjacent bare soil should be stabilized by mulching or other effective method.

5.4 (WB) Damaged Watercourse Crossing Structures: Culverts or other watercourse crossing structures damaged by the contractor to such an extent as to impair functionality should be repaired or replaced expeditiously; metal culverts are preferred over plastic culverts. The contractor should notify the appropriate Regional Water Board before initiating repairs as certain design standards or permitting requirements may apply.

5.5 (WB & CDFW) Watercourse Bank Stabilization: All bare soil exposed in conjunction with watercourse crossing construction, deconstruction,

maintenance, or repair, should be treated with sediment and erosion control measures immediately upon completion of work on the crossing, and prior to the onset of precipitation capable of generating runoff. Bank stabilization features should be constructed with suitable non-erodible materials that should be installed to withstand wash out during high flows. Bank stabilization materials should extend above the ordinary high- water mark. Only wildlife-friendly, 100 percent biodegradable erosion and sediment control products that will not entrap or harm wildlife should be used. Erosion and sediment control products should not contain synthetic (e.g., plastic or nylon) netting. Photodegradable synthetic products are not considered biodegradable. Rock riprap and bank armoring should only be done in consultation and with prior approval from the US Army Corps of Engineers, CDFW, or the appropriate Regional Water Board. Bioengineering, conducted primarily using native vegetation and minimal rock, should be the preferred bank stabilization methodology. Only clean materials that are free of trash, debris and not deleterious to aquatic life should be used in bank stabilization. Use of materials containing asphalt and/or concrete is prohibited. At no time should bank stabilization methods incorporate grouting.

5.6 (WB & CDFW) Removal of Watercourse Crossings: All materials used in constructing temporary watercourse crossings should be removed once the project is complete. During crossing removal, all fill material should be excavated in a manner that recreates the natural channel grade and orientation, leaving a channel bed that is as wide as or slightly wider than the original watercourse. If it must be wider than the original watercourse, it should be kept as close to the original width as feasible. All excavated materials should be placed at a stable location that will prevent future discharge(s) of materials to a watercourse.

Section 6: Water Drafting and In-Water Work

[Forest Practice Rule standards apply as specified.]

6.1 (WB) Use of Low Water Crossings and/or Fords: *Low* water crossings are temporary in nature, often installed to provide summer vehicle traffic typically across larger perennial streams and small rivers during low flows. Fords are watercourse crossings where vehicles drive on the bed of the watercourse channel (i.e., no man placed fill in or on the streambed). If operations will require the installation of a new low water crossing, please refer to BMPs 5.2 and 5.3 for temporary crossing installation. If operations will make use of an existing low water crossing, ensure that the crossing is properly stabilized before use, and appropriate sediment and erosion control measures are used.

If operations require the use of a ford with flowing water present, then consultation with the Regional Board is required. To expedite the consultation process, for all crossings the following information should be included in the workplans and available for Regional Board review:

- Classification of watercourse (I, II, III, IV),

- Number of times contractors anticipate they will cross,
- *Beneficial uses*, Total Maximum Daily Loads (TMDLs), and/or Clean Water Act Section 303d listing for impaired water bodies,
- Description of mitigation measures developed to prevent the discharge of sediment, earthen materials, and petroleum byproducts, and
- Description of stabilization measures to be used post-operations to restore watercourse as close as feasible to natural state.

Regional Board staff will review the information and provide recommendations to minimize and reduce impacts to Waters of the State and associated *beneficial uses*. If TMDLs and/or 303d listings are present, additional mitigation measures may be required. Additional information on low water crossing design can be found in the Pacific Watershed Associates' Handbook for Forest, Ranch, and Rural Roads. Federal regulations may still apply in Waters of the United States, to include US Army Corps of Engineers, NOAA National Marine Fisheries Service (NMFS), and US Fish and Wildlife Service.

6.2 (WB & CDFW) Water Drafting: Water drafting operations should be conducted so as not to dewater a watercourse. Water truck operators should be aware of current flow conditions, and water drafting should not occur if there is not adequate flow or if downstream reaches have the potential to be dewatered from drafting activities. Water drafting sites should:

- Ensure water drafting trucks parked on streambeds, *floodplains*, or within a WLPZ use drip pans or other devices such as adsorbent pads or absorbent blankets, sheet barriers or other materials as needed to prevent soil and water contamination from motor oil or hydraulic fluid leaks. See FPR 943.7 (l)(3)(D).
- Include appropriate BMPs to prevent sediment discharge from disturbed areas, vehicle tracking, or overtopping to receiving waters.
- Be clearly marked with signage or flagging, and sediment and erosion control methods to minimize impacts within the WLPZ.
- Ensure pump intakes are screened to prevent entrapment of aquatic species.
- Be inspected for fish, wildlife, and special-status plant species prior to performing water drafting activities. When fish and/or wildlife is found within the water drafting site, refer to BMP 8.4 on how to proceed.
- When water pumped from the project site is turbid, the outflow should be disposed of in a manner that prevents drainage directly into a watercourse. Examples are a settling area, Baker tank, silt bag, or upland area where the turbid water is allowed to settle and filter back into the soil and not through surface flow.

- Be decommissioned by removing the erosion control methods and returning the project site to baseline conditions.

Section 7: Drinking Water Operations Coordination

7.1 (WB) Coordination: Coordinate with State Water Board's Division of Drinking Water staff and area involved water systems for work performed in areas where drinking water infrastructure exists.

7.2 (WB) Coordination with area involved water systems: All activities necessitating the use of area water, such as, and not limited to dust suppression, cleaning, washing, sweeping, and irrigation, should be coordinated with the area involved water system to avoid any potential conflicts. All activities that may affect, impede, or impact the ability of the area involved water system from executing their duties should be coordinated with the area involved water system to avoid any potential conflicts.

7.3 (WB) Use of Water: Water from the work area involved water system should be conducted such that low operational pressures should be avoided. Low operational water system pressures can risk public health and result in the issuance of unsafe water alerts – boil water notice, or other. Coordinate with the area involved water system as to where to connect for water service as well as the rate of use and the equipment to use.

7.4 (WB) Water Meters: If and as required, local permits should be obtained, and use of water meters should be implemented. Contact the local jurisdiction to verify this requirement – City, County, area-involved water system.

7.5 (WB) Damage to Water Facilities. Any digging, debris removal, earth or soil work, or excavation can result in damage to water facilities including waterlines. Coordinate with the area involved water system so to understand where the water facilities, such as waterlines, are located to avoid these conflicts. The water service to the defunct locations may need to be shut off at the meter to prevent uncontrolled loss of water and water pressure. The area involved water system may need to shut-of the utility service valve and pull the meter, severing the connection to the customer line. Service connections should be staked painted blue to maintain visibility for any crews working in the area.

7.6 (WB) Temporary Debris Storage: Placement of debris piles may impede area involved water system access to their waterlines and facilities. Coordinate with area involved water system over the proper location of placement of debris materials and waste to avoid placing debris atop water system facilities and appurtenances.

7.5 (WB) Water System Infrastructure: Area involved water systems may be conducting restorative activities, such as, but not limited to, flushing waterlines, repairing water facilities, and replacing water facilities. Staging of materials, equipment and machinery may impede area involved water system access to

their waterlines and facilities. Coordinate with area involved water system over the proper location of staging of materials, equipment, and machinery.

Section 8: Fish and Wildlife Protection BMPs

8.1 (CDFW) Construction Monitoring. When assigned to the project, the qualified biologist will either be on-site or be available to arrive on site within a reasonable amount of time (one to two hours) during all project activities. Should a project site have CESA-listed species that may be impacted during operations and the qualified biologist cannot be present on-site, either the Operations Chief, Debris Group Supervisor, or their designee with training in application of BMPs may oversee project activities. At a minimum, the designated construction monitor should have attended the on-site education training and daily clearance survey.

8.2 (CDFW) Daily Clearance Survey: Before the start of daily project activities, the qualified biologist or designated construction monitor should survey the work area to ensure no new active nests, nest cavities, roosts, or dens have become established, including surveying any excavated areas within the work area to ensure trapped wildlife are allowed an opportunity to escape. This includes inspecting around and inside any open-ended pipes or infrastructure elements stored on the project site that will be moved or utilized during project activities.

8.3 (CDFW) Escape Ramp in Trench: At the end of each workday, an escape ramp should be placed at each end of any open excavation to allow wildlife that may become trapped to climb out overnight. The ramp may be constructed of either dirt fill or wood planking or other suitable material that is placed at an angle no greater than 30 degrees and has enough traction to allow wildlife to escape.

8.4 (CDFW) Detection of Wildlife: When wildlife is encountered during project activities, the wildlife should be allowed to leave the work area unharmed. If any CESA-listed wildlife is encountered, the qualified biologist or designated construction monitor should be notified, and the detection reported to the CDFW Contact by the Operations Chief, Debris Group Supervisor, or designee. If the wildlife is discovered to be caught in any pits, ditches, or other types of excavations, the qualified biologist should evaluate if it is unable to escape on its own, and if not, then the qualified biologist should capture and release it outside the work area into the most suitable habitat near the work area. Project activities should not be ceased if the observed wildlife is birds flying over or through the work area. If cessation of project activities due to detection of fish and/or wildlife would result in a clear and imminent danger to life or equipment, immediate action to prevent or mitigate loss of, or damage to, life, health, or equipment should be prioritized.

8.4.1 When detected wildlife is a wildlife habitat element, such as active nests, dens, roosts, roost trees, nest cavities and/or other wildlife habitat elements a buffer should be established between ongoing project activities and the detection site

so the wildlife are not disturbed, and it can be identified to species. The buffer should be delineated by temporary fencing or markers and remain in effect throughout project activities or until active nests, dens, roosts, roost trees, and/or nest cavity is/are no longer active, as determined by the qualified biologist. The buffer(s) should be determined by the qualified biologist and based on the life history of the species detected, including their sensitivity to noise, vibration, ambient levels of human activity and general disturbance, the current site conditions (screening vegetation, terrain, etc.), and the various project-related activities necessary to implement the project. If feasible, consider leaving some larger diameter snags and/or downed logs nearby that may provide food source and shelter for wildlife.

8.4.1.1 Raptor Detections: Raptor breeding season varies with geographic location and elevation, but generally occurs between February and August. When project activities during that timeframe include removal of trees, the trees marked for removal should be evaluated for evidence of raptor roosting, perching, feeding, or nesting. When detected and if possible, those trees should be retained. If an active raptor nest is discovered, a ¼ mile disturbance-free buffer around the nest should be established until the qualified biologist or CDFW Contact determines the nest has failed or the young have fledged.

8.4.1.2 Arboreal Mammal Detections: If a stick house, nest, occupied tree cavity, or similar habitat feature is found in the work area, the qualified biologist should install a 50-foot buffer around those features to avoid impacts from project activities. If project activities within the excluded area are unavoidable, activities within the buffer should occur under the direct supervision of the qualified biologist. In the event the habitat feature cannot be avoided, consultation with the CDFW Contact should occur to determine if the habitat feature is currently occupied. If the habitat feature is determined to be occupied, and avoidance of impacts cannot be achieved with a timing shift of project activities, the qualified biologist and CDFW Contact should collaborate on a relocation plan for the feature and adult wildlife. If it is determined the habitat feature is occupied and has a nest with young, the habitat feature should be avoided until the qualified biologist determines the young have matured and either left the nest or are sufficiently mature enough to be captured and relocated.

8.4.1.3 Ground-dwelling Mammal Detections: Project activities should avoid damage to mammal burrows and dens if possible. If burrows and dens cannot be avoided the qualified biologist should identify and flag all active mammal burrows and dens within the work area and establish a 50-foot no-disturbance buffer until the qualified biologist determines the burrow or den is not in use. If excavation activities must occur in areas where burrows cannot be avoided, excavation and grading should occur under the supervision of the qualified biologist using 6-inch lifts to avoid take.

8.4.1.4 Tree Removal with Active Bat Roost: When a tree with an active bat roost is selected for removal, the tree should be removed using a two-step removal process. The limbs of the tree should be removed and left on the ground while the trunk is left in place during the first day, and during the following day the trunk should be removed. This process will allow the bats the opportunity to vacate the roost during the night prior to the trunk removal.

8.4.1.5 Rock Outcrops and Downed Logs: When rock outcroppings and downed logs that may provide shelter for wildlife are present within the work area, a buffer should be installed to exclude the feature from the area where active work is being performed. If downed logs and/or boulders must be removed, the qualified biologist with a designated construction monitor should survey the area prior to the start of removal activities to prevent wildlife mortality to the extent possible.

8.4.2 When detected wildlife is determined to be a CESA-listed species or evidence of their active presence is identified, the detection site should be buffered and all project activities at and immediately adjacent to the detection site should cease until consultation between the Operations Chief, Debris Group Supervisor, or designee and the CDFW Contact occurs.

8.4.3 When detected wildlife is determined to not be a CESA-listed species and a buffer is not feasible while allowing work to continue, and the species is not protected by federal regulations, the qualified biologist may attempt to safely capture and relocate the wildlife according to the applicable group-specific measure.

8.5 (CDFW) Amphibian Detections: If an amphibian is observed within the work area and it cannot leave of its own volition, all work within the immediate area (50 feet) should stop, all equipment powered off and work should not continue until the qualified biologist can relocate it according to Measure 8.9.3.

8.6 (CDFW) Snake Avoidance. Any exclusion fencing surrounding the work area should include maintaining a clearing of the vegetation within one meter on the side of the fence away from the work area at a maximum height of four inches, with the intention that vegetation will not allow a snake to pass over the exclusion fencing. If a snake species of any kind is observed within the exclusionary fencing during project activities, then all work within the immediate area (200 feet) should halt and should not continue until the snake species can be identified by the qualified biologist, captured, and removed from the work area.

8.7 (CDFW) Trout and Salmon/Anadromous salmonids: When project activities must be conducted within or adjacent to watercourses that have the potential to support anadromous salmonids, consultation with the qualified biologist and the CDFW Contact should occur during the project planning phase to ensure habitat features essential to anadromous salmonids are retained. These features include but may not be limited to properly placed and sized in-stream large

woody debris, gravel beds consisting of gravel between 5.4 and 78 mm in diameter used for spawning, erosion controls on banks that have experienced high vegetation loss, in-stream pools with high structural complexity, and riparian vegetation. Project activities should avoid dewatering or sedimentation within these essential habitat elements.

If in-water project activities must occur during seasonal movement periods of anadromous salmonids (including sensitive life cycle stages such as spawning, eggs, alevins, fry), typically June 15 through October 15, installation, maintenance, and removal of temporary in-water structures should be avoided if possible. If not possible, installation, maintenance, and removal of temporary in-water structures should only occur under the direct observance of a qualified fish biologist following the measures in Sections 5, 6, and 8, and BMP 1.6.1.

8.8 (CDFW) Non-anadromous Fish: When project activities must be conducted within or adjacent to current and historical watercourse with the potential to support non-anadromous fish with CESA protections, consultation with the qualified biologist and the CDFW Contact should occur during the project planning phase to ensure habitat features essential to the species are retained. These features can include, but are not limited to, amount of flow and temperature of water through the project site, historical and potential spawning habitat, in-water cover element such as large boulders, large woody debris, in-stream pools with high structural complexity, and riparian vegetation. Project activities should avoid dewatering or sedimentation within these essential habitat elements.

If in-water project activities must occur, installation, maintenance, and removal of temporary in-water structures should be avoided. Where temporary in-water structures are unavoidable, installation, maintenance, and removal should only occur under the direct observance of a qualified fish biologist following the measures in Sections 5, 6, and 8, and BMP 1.6.1.

8.9 (CDFW) In-Water Work and Stranded Wildlife Protection: When project activities include water diversion and dewatering that will impact native fish, amphibians, reptiles, and other aquatic wildlife, the following measures apply:

8.9.1 Stranded Aquatic Wildlife: The daily clearance surveys should include a check for stranded aquatic life as the water level in the dewatered area is maintained. All reasonable efforts should be made to capture and move all stranded aquatic life observed in the dewatered areas. Capture methods may include fish landing nets, dip nets, bucket, and by hand. When these methods are not possible, the CDFW Contact may approve the use of electrofishing in lieu of the above methods.

8.9.2 Timing of Initial Aquatic Wildlife Relocation: If feasible, the qualified biologist should perform initial aquatic wildlife relocation efforts several days prior to the start of active project activities. This provides the qualified biologist an

opportunity to return to the work area and perform additional captures immediately prior to active project activities.

8.9.3 Relocation of Stranded Fish and Wildlife: If found within the work area, and not able to leave on their own, the qualified biologist should capture and relocate all fish and wildlife incapable of leaving the work area on their own. For CESA-listed species, please reference Exhibit 2.4 on how to proceed with CDFW coordination. Measures should be taken to avoid harm and mortality resulting from relocation activities, as follows:

8.9.3.1 Release Locations Criteria: Prior to beginning project activities, the most appropriate release location(s) for expected wildlife should be determined by the qualified biologist using the following criteria: water temperature should be similar to the capture location; there should be ample habitat for the relocated wildlife; relocation areas should be in proximity to the site, not be affected by project activities, and be free of exotic predatory species (i.e., bullfrogs, crayfish) to the best of the qualified biologist's knowledge. When amphibian egg masses are found, the qualified biologist should make every attempt to wait until the egg masses hatch to transport them. There should be a low likelihood for the animals to re-enter the project site or become impinged on exclusion structures or water intake screening.

8.9.3.2 Relocated Records: Relocated fish and wildlife should be moved to the release location determined by the qualified biologist. A record should be maintained of all relocated wildlife. The record should include the date of capture and relocation, the method of capture, the location of the relocation site in relation to the project site, and the number and species of fish and wildlife captured and relocated. The record should be provided to CDFW within two weeks of the completion of project activities.

8.9.3.3 Wet Hands and Nets: Handling of aquatic wildlife within the project site should be minimized. However, when handling is necessary, the qualified biologist conducting the handling should always remove topical products from hands such as insect repellant and sunblock, and wet hands or nets prior to touching the wildlife.

8.9.3.4 Water Temperatures and Water Changes: The qualified biologist should measure air and water temperatures periodically. A thermometer should be placed in holding containers and, if necessary, periodically conduct partial water changes to maintain a stable water temperature. If water temperature reaches or exceeds 21 °C, or 2 degrees higher than ambient water temperature, aquatic wildlife should be released, and relocation operations ceased unless temperatures can be maintained at a safe level. If deemed necessary, the qualified biologist may use a water additive, such as stress coat, to aid during capture and handling.

8.9.3.5 Proper Holding Technique: Holding containers should be sized such that adult wildlife will fit without touching the sides. The qualified biologist should

temporarily hold aquatic wildlife in cool, shaded, aerated water in a bucket, insulated cooler, flow-through live car or similar setup. The qualified biologist should protect aquatic wildlife from jostling and noise and should not remove the wildlife from this container until time of release.

8.9.3.6 No Overcrowding: Overcrowding in containers should be avoided by having at least two containers and segregating species of wildlife, young-of-year, or juveniles, and wildlife from larger age-classes to avoid predation. If wildlife in the dewatered area is abundant, the capturing should stop periodically, as each captured group is released at the predetermined locations.

8.9.3.7 Relocate During Cool Temperatures: Where possible the qualified biologist should conduct collection and relocation activities in the morning or evening when the temperatures are cooler.

8.9.3.8 Mortality Rate of Fish and Wildlife: If mortality during relocation exceeds more than a total of three fish and/or wildlife individuals, capturing efforts should be stopped and the qualified biologist should immediately consult with the CDFW Contact.

Section 9: Forest Practice Rules

The California Department of Forestry and Fire Protection (CAL FIRE) administers the Z'berg-Nejedly Forest Practice Act (2022 California Forest Practice Rules (FPR)) for non-federal timberlands. The removal of hazardous trees is an integral part of the Debris Removal Activities for which the following FPR BMPs will apply.

In addition, a portion of the Forest Practice Rule requirements for cultural resource protection and documentation (contained in Exhibit 2.5) was suspended for the 2020 Statewide Wildfires to remove duplicate requirements for federally declared disasters. For local or state proclaimed disasters, such Forest Practice Rule requirements for cultural resource protection and documentation are not suspended. CAL FIRE Contacts are contained in Exhibit 6.1b.

9.1 Licensed Timber Operator: The Licensed Timber Operator (LTO) will comply with the Forest Practice Rules.

9.2 Notice of Emergency Operations (CCR 1052): Where applicable, if construction of new road is necessary, a Notice of Emergency Operations (CCR 1052) will be submitted to CAL FIRE and any required permitting from the appropriate RWQCB (as applicable to the specific property) will be obtained.

9.3 Location and Classification of All Watercourses: The Registered Professional Forester (RPF) or a supervised designee will identify the classification of all water courses and flag the WLPZ.

9.4 In Lieu Practices: If in lieu practices (exceptions to rules or alternative practices are not specifically suspended) are determined to be necessary, a Notice of Emergency Operations (CCR 1052) will be submitted to CAL FIRE

Exhibit 2.0: State Resource Agency Contacts

Refer to Attachments

Exhibit 2.1 - Suggested Training for Contractors

Best Management Practices (BMPs) and Avoidance and Minimization Measures

- How to properly install, maintain, and remove BMPs and AMMs
- How to properly store BMPs in staging areas to prevent degradation
- When it is appropriate to use each type of BMP and AMM
- When certain BMPs and AMMs are NOT appropriate to use, and others must be used
- What effective site stabilization and BMP and AMM applications should look like before a property is signed off and returned to the county or landowner
- Provide examples of common scenarios for debris only, hazard tree only, and full program for the bullets above

Environmental Protection Plan

- How it is structured
- How to use the quick reference guide
- How to find contact information and communication protocols
- Consultation needs with resource protection agencies
- Provide an overview of any attachments

Checklists

- What the site assessment and final site walk checklists are
- When they must be used
- How to use them (especially if they are in a Field Maps or Survey 1,2,3 platform)

Other Topics

- Federal requirements that are not suspended (e.g., CWA §404 and §402)
- Differences between Federally declared disasters and State-Only disasters
- Briefly highlight and provide links/handouts for reference materials to aid in work planning and operations, e.g., the Pacific Watershed Associates Rural Roads Handbook

Exhibit 2.2 - EPP Definitions

100-year floodplain includes areas determined based on delineations completed or approved by the U.S. Army Corps of Engineers, the Federal Emergency Management Agency, or an individual qualified to make floodplain delineations. These areas include land adjacent to waterbodies that extend to the outer perimeter of lands which experience flooding or are inundated with water during 100-year flood events.

Anadromous Fish are fish, such as native salmon (e.g., Chinook salmon, coho salmon, etc.) and ocean-run trout (e.g., steelhead and cutthroat trout) which spawn in fresh water and spend a portion of their lives in the ocean. *Fish and Game Code (FGC) Division 0.5, Chapter 1, Section 14.*

Anadromous Salmonid Protection Rules are a section of the California Forest Practice Rules (14 CCR, §916.9) that provide specific regulatory requirements and protection measures beyond the standard rules, for watersheds that contain anadromous salmonids.

Beneficial Uses of the waters of the state that may be protected against degradation include, but are not limited to, domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. *Water Code (WC) Division 7, Chapter 2, Section 13050(f)*.

Best Management Practice means a practice, or combination of practices, that are intended to prevent or reduce environmental impacts, including but not limited to pollution prevention practices, erosion and sediment control measures, or implementation of modern construction design standards.

California Forest Practice Rules are meant to implement the provisions of the Z'berg-Nejedly Forest Practice Act of 1973 in a manner consistent with other laws, including but not limited to, the Timberland Productivity Act of 1982, the California Environmental Quality Act (CEQA) of 1970, the Porter Cologne Water Quality Act, and the California Endangered Species Act.

Commercial Species (Hazard Tree Removal) means distinct species in each Forest District found in group A and those in group B that are found on lands where the species in group A are now growing naturally or have grown naturally in the recorded past. See FPR Section 895.1, Definitions, for a full list for each Forest District.

Dewatering a Watercourse means removal or draining of groundwater or surface water from a streambed by pumping or other methods.

Domestic or Municipal Water Supply means groundwater or surface water that provides drinking water either via wells or water treatment systems.

Fords are watercourse crossings where vehicles drive on the bed of the channel (i.e., no man placed fill in or on the streambed).

Hazardous Material means a material listed in paragraph (2) of the California Health and Safety Code (HSC) that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or environment, or a material specified in an ordinance adopted pursuant to paragraph (3) of the HSC. Hazardous materials include all the following:

- A substance or product for which the manufacturer or producer is required to prepare a material safety data sheet pursuant to the Hazardous Substances Information and Training Act (Chapter 2.5 (commencing with Section 6360) of Part 1 of Division 5 of the Labor Code) or pursuant to any applicable federal law or regulation.
- A substance listed as a radioactive material in Appendix B of Part 30 (commencing with Section 30.1) of Title 10 of the Code of Federal Regulations, as maintained and updated by the United States Nuclear Regulatory Commission.
- A substance listed pursuant to Title 49 of the Code of Federal Regulations.
- A substance listed in Section 339 of Title 8 of the California Code of Regulations.
- A material listed as a hazardous waste, as defined by HSC Sections 25115, 25117, and 25316.

Hazardous Substances means either of the following *(per WC Division 7, Chapter 2, Section 13050(p)(1)):*

A. For discharge to surface waters, any substance determined to be a hazardous substance pursuant to Section 311(b)(2) of the Federal Water Pollution Control Act (33 U.S.C. Sec. 1251 et seq.).

B. For discharge to groundwater, any substance listed as a hazardous waste or hazardous material pursuant to Section 25140 of the Health and Safety Code, without regard to whether the substance is intended to be used, reused, or discarded, except that "hazardous substance" does not include any substance excluded from Section 311(b)(2) of the Federal Water Pollution Control Act because it is within the scope of Section 311(a)(1) of that act.

Hydrologic Disconnection means the removal of direct routes of drainage or overland flow of road runoff to a watercourse or lake (FPR section 895.1). See Figure 1 below, excerpted from the Pacific Watershed Forest, Ranch, and Rural Roads Handbook and also found in Technical Rule Addendum No. 5 of the Forest Practice Rules (http://www.pacificwatershed.com/sites/default/files/5_-_chapter_4_-_road_and_stream_crossing_design.pdf).

Figure 1: Hydrologic Disconnections

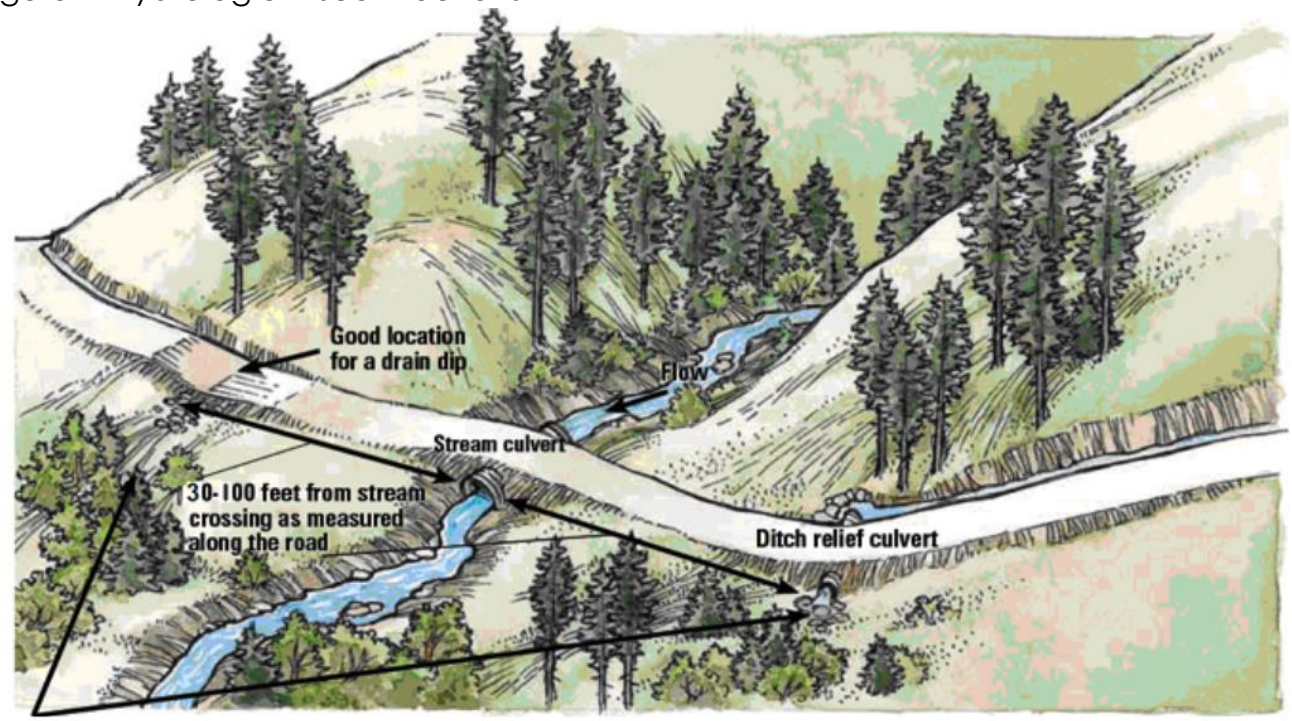


FIGURE 85. *Diagram showing hydrologic disconnection on the approaches to a stream crossing. Note the absence of an apparent critical dip at the crossing. (Modified from: Adams and Storm, 2011; see Appendix C for use in TRA #5).*

Low Water Crossings are temporary in nature, often installed to provide summer vehicle traffic typically across larger perennial streams and small rivers during low flows.

Nonpoint Source (NPS) Pollution is technically defined to mean any source of water pollution that does not meet the legal definition of point source in Section 502(14) of the Federal Clean Water Act of 1987. Unlike point source pollution which comes from a confined, discrete conveyance, NPS pollution comes from many diffuse sources.

In the context of PPDR activities, sources of NPS pollution include but are not limited to road construction, maintenance, and use; debris and hazard tree removal; watercourse crossing construction, maintenance, and use; use of skid trails and landings; and ground disturbing activities.

Ordinary High-Water Mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Pesticides include herbicides for destroying weeds and other unwanted vegetation, insecticides for controlling a wide variety of insects, fungicides used to prevent the growth of molds and mildew, and disinfectants for preventing the spread of bacteria, and compounds used to control mice and rats.

Reasonable Access means that personnel from the California Department of Fish and Wildlife, State Water Resources Control Board and Regional Water Quality Control Boards, and/or Department of Forestry and Fire Protection, if accompanied by the agency(ies) listed on the Right-of-Entry and after 24-hour advance notice is given, may enter and inspect operations during normal business hours at any time throughout the duration of operations, and prior to the property being returned to the landowner.

Riparian means the banks and other adjacent terrestrial environs of lakes, watercourses, estuaries, and wet areas, where transported surface and subsurface freshwaters provide soil moisture to support mesic vegetation.

Saturated Soil Conditions: Soil and/or surface material pore spaces are filled with water to such an extent that runoff is likely to occur. Indicators of Saturated Soil Conditions may include but are not limited to:

- Areas of ponded water
- Pumping of fines from the soil or road surfacing material during Timber Operations
- Loss of bearing strength resulting in the deflection of soil or road surfaces under a load, such as the creation of wheel ruts
- Spinning or churning of wheels or tracks that produces a wet slurry
- inadequate traction without blading wet soil or surfacing materials

See Forest Practice Rules Section 895.1 definitions for "Saturated Soil Conditions."

Significant Sediment Discharge means soil erosion that is currently, or as determined based upon visible physical conditions, may be in the future, discharged to watercourses or lakes in quantities that violate water quality requirements or result in significant individual or cumulative adverse impacts to the beneficial uses of water. One indicator of a significant sediment discharge is a visible increase in turbidity to receiving Class I, II, III, or IV waters (FPR Section 895.1).

Stabilized means exposed soils and unstable areas have been treated in such a manner that there is low risk of such soils discharging to a waterbody via runoff, slumping, or wind erosion. Appropriate treatment can vary and can include, but is not limited to: cover with mulch (weed free straw, slash, etc.), rocks, tarp, etc.; relocation of excess material to an area that is stable, well drained, isolated from wet areas or watercourses, and where wind exposure is limited; sloping back excess material to a stable angle; hydroseeding, seeding and/or planting; and/or temporary construction erosion control measures (e.g., fiber rolls, silt fences, erosion control blankets, tarps).

Tributary/Tributaries each mean a water that contributes flow, either directly or through another water, to a water identified in paragraphs (a)(1) through (3) of this section that is characterized by the presence of the physical indicators of a bed and banks and an ordinary high-water mark. These physical indicators demonstrate there is volume, frequency, and duration of flow sufficient to create a bed and banks and an ordinary high-water mark, and thus to qualify as a tributary. A tributary can be a natural, man-altered, or man-made water and includes waters such as rivers, streams, canals, and ditches not excluded under paragraph (b) of this section. A water that otherwise qualifies as a tributary under this definition does not lose its status as a tributary if, for any length, there are one or more constructed breaks (such as bridges, culverts, pipes, or dams), or one or more natural breaks (such as wetlands along the run of a stream, debris piles, boulder fields, or a watercourse that flows underground) so long as a bed and banks and an ordinary high water mark can be identified upstream of the break. A water that otherwise qualifies as a tributary under this definition does not lose its status as a tributary if it contributes flow through a water of the United States that does not meet the definition of tributary or through a non-jurisdictional water to a water identified in paragraphs (a)(1) through (3) of this section.

Turbid means the water is cloudy and opaque and has suspended sediment and/or other suspended materials present. Turbidity is the measure of relative clarity of a liquid. It is an optical characteristic of water and is a measurement of the amount of light that is scattered by material in the water when a light is shined through the water sample. The higher the intensity of scattered light, the higher the turbidity.

Watercourse means any well-defined channel with distinguishable bed and bank showing evidence of having contained flowing water indicated by deposit of rock, sand, gravel, or soil, including but not limited to, Streams as defined in PRC 4528(f). Watercourse also includes manmade watercourses (FPR Section 895.1).

Watercourse and Lake Protection Zone (WLPZ) means a strip of land, along both sides of a Watercourse or around the circumference of a lake or spring, where additional practices may be required for protection of the quality and beneficial uses of water, fish and Riparian wildlife habitat, other forest resources and for controlling erosion *(See FPR 895.1, Definitions; also see FPRs 916.5, 936.5, and 956.5 for determining WLPZ Widths and protective measures)*

Watercourse Crossing (Permanent) means a watercourse crossing that will remain in place after operations have been completed.

Watercourse Crossing (Temporary) means a watercourse crossing that will be removed, and the channel and site stabilized after operations have been completed.

Waters of the State means any surface water or groundwater, including saline waters, within the boundaries of the state. *WC Division 7, Chapter 2, Section 13050(e)*.

Waters of the United States means jurisdictional waters. For purposes of the Clean Water Act, 33 U.S.C. 1251 *et seq.* and its implementing regulations, subject to the

exclusions in paragraph (b) of this section, the term "waters of the United States" means:

- The territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide
- Tributaries (see tributaries defined above)
- Lakes and ponds, and impoundments of jurisdictional waters
- Adjacent wetlands

Winter Period means the period between November 15 to April 1, except as noted under special county rules at 14 CCR, Article 13, Section 925.1, 926.18, 927.1, and 965.5, where the winter period occurs from October 15 to April 15; this is known as the *Extended Wet Weather Period*.

Exhibit 2.3: Site Assessment Checklist for Statewide EPP

The two checklists herein should be used by contractors during their initial site assessment and interim (pre-final) site walks. **If you check yes** to any of the questions in items "b" through "i", please attach this checklist to the parcel's file and have it available upon request.

Initial Site Assessment Checklist

Parcel/Site Identification #: _____

a.	Please check all that apply to this site:
	☐ Debris Removal ☐ Hazard Tree Removal ☐ Staging Area, Debris Management Site, Equipment Storage and/or Maintenance, etc.
b. ☐[Yes] ☐ [No]	Are there any watercourses or lakes classified as a CLASS I through CLASS IV within or adjacent to the site's planned work area? (Check all that apply)
	Within Plan Area Within Area / 200 feet of Plan Area ☐ Class I ☐ ☐ ☐ Class II ☐ ☐ ☐ Class III ☐ ☐ ☐ Class IV ☐ ☐ ☐ Lakes ☐ ☐ ☐ Other (e.g., Springs, seeps) ☐ ☐
c. ☐[Yes] ☐ [No	Do floodplains exist within or near the site?
d. ☐[Yes] ☐ [No]	Does accessing this site or work within this site require construction or reconstruction of a watercourse crossing, and/or will you be conducting any type of activity within 200 feet of designated critical habitat? If so, please check the following:
	☐ Will you be crossing a Class I, Class II, or Class III watercourse? ☐ Will you be placing a structure in the channel? What type of watercourse crossing must be constructed/reconstructed: ☐ rock armored fill ☐ rocked ford ☐ culverted ☐ bridge
e. ☐[Yes] ☐ [No]	Will you be building, maintaining, or upgrading roads within or adjacent to a watercourse and lake protection zone, floodplain, or other wet area to access and/or conduct work within this site?
f. ☐[Yes] ☐ [No]	Do you anticipate any in-lieu activities under the California Forest Practice rules that may impact waters of the state to occur at this site?
g. ☐[Yes] ☐ [No]	Will you be removing debris from a structure footprint within 200 feet of a watercourse?
h. ☐[Yes] ☐ [No]	Will you be conducting any type of activity within 200 feet of anadromous fish habitat?
i. ☐[Yes] ☐[No]	Will you be conducting any type of activity within 200 feet of designated critical habitat?
j. ☐[Yes] ☐[No]	Will this parcel require a Final Site Walk checklist (2024 California Wildfires EPP Exhibit 2.5)? If you checked yes to any of the boxes in items b. through i., then check yes.

Exhibit 2.4: CDFW 2024 Wildfires Habitats and Special Status Species Impacted by Fire Name, Watershed, and County, and CDFW Species-Specific Measures

(To be provided prior to debris and hazard tree operations commence)

Exhibit 2.5: Final Site Walk Checklist[2]

Parcel/Site ID:	Please attach this checklist to the site's file upon completion	
Activity	**Erosion and Sediment Control BMPs**	**Complete?**
Skid Trails	Drainage structures have been installed in a manner that will prevent concentrated flows from discharging into waters of the state.	☐
	Surface of skid trails have been treated where needed in a manner that will reduce rill initiation, gullying and sheet erosion.	☐
	Within the Watercourse and Lake Protection Zone (WLPZ) and skid trails on steeper slopes (i.e., greater than 30%) which lead into the WLPZ: skid trail surfaces have been treated with erosion control measures (chips, mulch, slash etc.) and drainage structures (e.g., waterbreaks, rolling dips) have been installed at a frequency that will prevent sediment discharging to a watercourse.	☐
Temporary Watercourse Crossings	Fine soils or organic materials deposited into a watercourse by operations have been removed, stored, and stabilized to reduce risk of discharging to a watercourse.	☐
	The bed and bank of watercourses disturbed during operations have been recontoured as close as feasible to the natural slope and stabilized with appropriate erosion control measures.	☐
	Drainage structures have been installed on the approaches to watercourse crossings (water bars, rolling dips, out sloping) in a manner that will prevent concentrated flows from reaching the watercourse.	☐
	Approaches to watercourse crossings have been stabilized in a manner that will prevent sediment discharge to the watercourse.	☐
Trees felled Across Watercourses	Disturbance to the bed and/or bank of the watercourse has been stabilized to prevent erosion and deterioration.	☐
	All woody debris located within the watercourse channel as a result of felling operations has been removed unless installed through an approved aquatic habitat restoration project (e.g., large woody material augmentation)	☐
WLPZ Operations	Ground disturbance within the WLPZ from operations has been stabilized with suitable material (slash, chips, bark etc.) to a depth adequate to reduce erosion and sediment discharge to waters of the state.	☐
Roads	Roads are hydrologically disconnected from watercourse crossings.	☐
	All new and existing roads used during debris and/or hazard tree removal have been treated with water or other suitable tackifiers and recompacted to minimize the erosion of the road surface.	☐
Debris Removal Sites	Disturbances near a watercourse are properly stabilized with erosion and sediment control measures that are appropriate for the site.	☐
	Any damaged/destroyed erosion and sediment control measures that were deployed during operations are removed and replaced as appropriate; biodegradable materials can remain on site, but all others should be removed.	☐
	Necessary maintenance of BMPs is completed (e.g., removing any built-up sediment behind fiber rolls or other BMPs that were used during operations).	☐

[2] **THIS CHECKLIST IS NOT ALL-INCLUSIVE. ALL BMP PROVISIONS IN THE EPP STILL APPLY:** This checklist does not include every BMP or requirement that is detailed in the EPP; all EPP provisions still apply. This checklist is intended to guide the identification of key BMPs to help facilitate effective site stabilization and minimize impacts to surface waters from debris and hazard tree removal operations.

Exhibit 2.6: Example Forest Practice Rule Cultural Resource Protection Suspension

See Attachment from 2022 EPP

III. FEMA and Federal Resource Agency Consultations

Refer to attached Programmatic Agreements

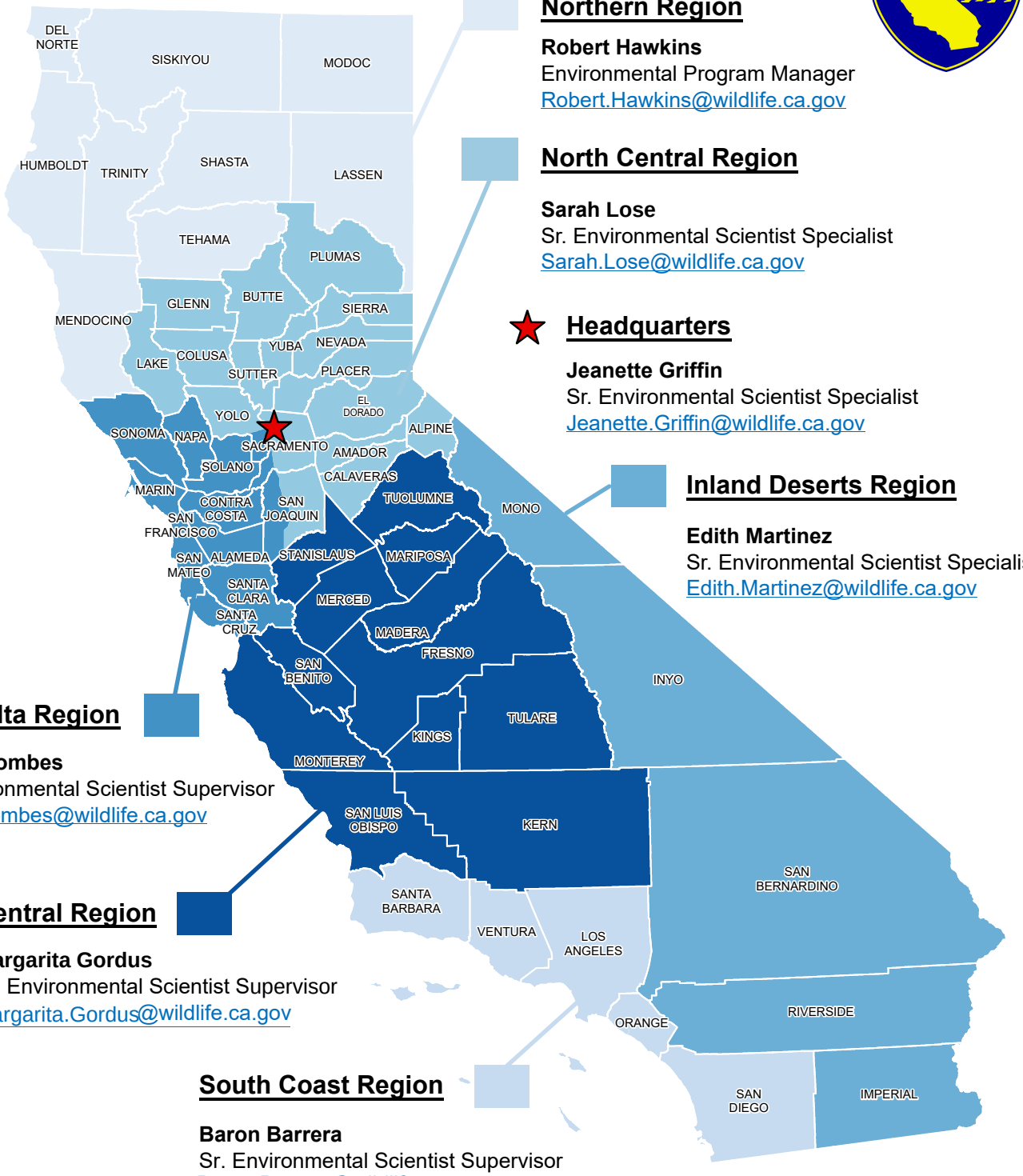
In the event that State Proclaimed Disasters subject to the EPP become Presidentially Declared Major Disasters during the performance of disaster debris and hazard tree removal program, the Federal Flood Risk Management Standard (FFRMS) that became effective September 9, 2024, will need to be addressed to comply with Executive Order No. 11988, Floodplains.

The Federal Flood Standard Support Tool to do so is accessible via the following link: https://floodstandard.climate.gov/.

Wildfire Recovery: State & Regional Water Boards Contact Information				
Office	**Contact Name and Email**	**Work Phone**	**When to contact**	**Counties Covered**
State Water Board	Primary: Krystle.Taylor@waterboards.ca.gov Back-Up: Mark.Bare@waterboards.ca.gov	Krystle: 916.917.4133 Mark: 916.917.4089	High-level Suspension & EPP Coordinaton/Policy/Development/Hot Wash Watershed Debris Flow Task Force Communications Debris Task Force Communications All Other Wildfire Coordination	All California Counties
North Coast Regional Water Board	Jonathan.Warmerdam@waterboards.ca.gov	707.576.2468	EPP Annual Hot Wash	Del Norte, Glenn (Western edge portion), Humboldt, Lake (Northern portion), Marin, Mendocino, Modoc, Siskiyou, Sonoma, Trinity
	Gil.Falcone@waterboards.ca.gov	707.576.2830	EPP Field Operations Coordination for Sonoma and Mendocino Counties	
	Ryan.Bey@waterboards.ca.gov	707.576.2679	EPP Field Operations Coordination for Del Norte, Trinity, & Siskiyou Counties	
San Francisco Bay Regional Water Board	Krystle.Taylor@waterboards.ca.gov	916.917.4133	EPP Field Operations Coordination	Alameda, Contra Costa, San Francisco, Santa Clara (North of Morgan Hill), San Mateo, Marin, Sonoma, Napa, Solano
Central Coast Regional Water Board	Alexandra.Coblentz@waterboards.ca.gov	805.542.4786	EPP Field Operations CoordintionEPP Annual Hot Wash	Santa Clara (South of Morgan Hill), San Mateo (Southern Portion), Santa Cruz, San Benito, Monterey, Kern (very small portions), San Luis Obispo, Santa Barbara, Ventura (Northern portion)
Los Angeles Regional Water Board	Krystle.Taylor@waterboards.ca.gov	916.917.4133	EPP Field Operations Coordination	Los Angeles, Ventura, Kern & Santa Barbara (very small portions)
Central Vally Regional Water Board - Redding	Griffin.Perea@waterboards.ca.gov	530.224.3217	EPP Field Operations CoordinationEPP Annual Hot Wash	Butte, Glenn (Eastern portion), Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama
	Ashley.Hernandez@waterboards.ca.gov	530.224.4206	EPP Field Operations Coordination - Hazard Tree Removal	
	Katie.Gilman@waterboards.ca.gov	530.224.3212	EPP Field Operations Coordination - Debris Removal	
Central Valley Regional Water Board - Sacramento	Lowell.Cottle@waterboards.ca.gov	916.464.4854	EPP Field Operations CoordinationEPP Annual Hot Wash	Colusa, Lake (Southern portion), Sutter, Yuba, Sierra, Nevada, Placer, Yolo, Napa (N. East), Solano (West), Sacramento, El Dorado, Amador, Calaveras, San Joaquin, Contra Costa (East), Stanislaus, Toulumne, Merced, (Very small portions of San Benito, San Luis Obispo)
Central Valley Regional Water Board - Fresno	Rebecca.Hipp@waterboards.ca.gov	559.445.5977	EPP Field Operations CoordinationEPP Annual Hot Wash	Fresno, Kern (Western portion), Kings, Madera, Mariposa, Merced, Tulare
Lahontan Regional Water Board	Jeremy.Feinberg@waterboards.ca.gov	530.542.5434	EPP Field Operations CoordinationEPP Annual Hot Wash	Modoc (East), Lassen (East side and Eagle Lake), Sierra (Small eastern portion), Nevada, Placer, El Dorado, Alpine, Mono, Inyo, Kern (East), San Bernardino, Los Angeles (N/E corner)
Colorado River Basin Regional Water Board	Krystle.Taylor@waterboards.ca.gov	916.917.4133	EPP Field Operations Coordination	Imperial, San Bernardino, Riverside, San Diego
Santa Ana Regional Water Board	Krystle.Taylor@waterboards.ca.gov	916.917.4133	EPP Field Operations Coordination	Orange, Riverside, San Bernardino
San Diego Regional Water Board	Krystle.Taylor@waterboards.ca.gov	916.917.4133	EPP Field Operations Coordination	San Diego, Imperial, Riverside

CDFW Contacts for CalOES

Post-Fire Recovery



Northern Region

Robert Hawkins
Environmental Program Manager
Robert.Hawkins@wildlife.ca.gov

North Central Region

Sarah Lose
Sr. Environmental Scientist Specialist
Sarah.Lose@wildlife.ca.gov

Headquarters

Jeanette Griffin
Sr. Environmental Scientist Specialist
Jeanette.Griffin@wildlife.ca.gov

Inland Deserts Region

Edith Martinez
Sr. Environmental Scientist Specialist
Edith.Martinez@wildlife.ca.gov

Bay Delta Region

Julie Coombes
Sr. Environmental Scientist Supervisor
Julie.Coombes@wildlife.ca.gov

Central Region

Margarita Gordus
Sr. Environmental Scientist Supervisor
Margarita.Gordus@wildlife.ca.gov

South Coast Region

Baron Barrera
Sr. Environmental Scientist Supervisor
Baron.Barrera@wildlife.ca.gov

Cal OES
GOVERNOR'S OFFICE OF EMERGENCY SERVICES

**This map is to be used by CalOES and their contractors to identify the appropriate CDFW point-of-contact for post-fire recovery efforts.
Updated April 24, 2024

CAL FIRE Regional Unit Forester Contact List

Northern Region

Coast Manager - *Santa Rosa* Eric Hedge, Forester III 707-576-2959 Eric.Hedge@fire.ca.gov

Sierra, Cascade Manager - *Redding* Jon Woessner, Forester III 530-224-2445 Jonathan.Woessner@fire.ca.gov

AEU 2700	**Amador-El Dorado Unit** Megan Scheeline, Forester II 530-708-2705 Megan.Scheeline@fire.ca.gov	**LMU 2200**	**Lassen-Modoc Unit** Ivan Houser, Forester II 530-257-8503 Ivan.Houser@fire.ca.gov	**SCU 1600**	**Santa Clara Unit** Edgar Orre, Forester II 408-206-3704 Edgar.Orre@fire.ca.gov
BTU 2100	**Butte Unit** David Derby, Forester II 530-872-6334 Dave.Derby@fire.ca.gov	**LNU 1400**	**Sonoma-Lake Napa Unit** Kim Sone, Forester II 707-576-2344 Kim.Sone@fire.ca.gov	**SHU 2400**	**Shasta-Trinity Unit** Ben Rowe, Forester III 530-225-2432 Benjamin.Rowe@fire.ca.gov
CZU 1700	**San Mateo-Santa Cruz Unit** Richard Sampson, Forester II 831-335-6742 Richard.Sampson@fire.ca.gov	**MEU 1100**	**Mendocino Unit** Colby Forrester, Forester III 707-459-7454 Colby.Forrester@fire.ca.gov	**SKU 2600**	**Siskiyou Unit** Steve Wilson, Forester II 530-598-2604 Steve.Wilson@fire.ca.gov
HUU 1200	**Humboldt-Del Norte Unit** Chris Curtis, Forester III 707-726-1256 Chris.Curtis@fire.ca.gov	**NEU 2300**	**Nevada-Yuba-Placer Unit** Steven Garcia, Forester II 530-889-0111 Ext. 139 Steven.Garcia@fire.ca.gov	**TGU 2500**	**Tehama-Glenn Unit** Dawn Pedersen, Forester II 530-528-5199 Dawn.Pedersen@fire.ca.gov

Southern Region

Fresno Manager Yanik Zuluaga, Forester II 559-240-5394 yanik.zuluaga@fire.ca.gov

BDU 3500	**San Bernardino Unit** David Haas, Forester II 909-253-6632 David.Haas@fire.ca.gov	**MMU 4200**	**Madera-Mariposa-Merced Unit** Brian Mattos, Forester II 209-742-1907 Brian.Mattos@fire.ca.gov	**SLU 3400**	**San Luis Obispo Unit** David Erickson, Forester I 805-903-3406 David.Erickson@fire.ca.gov
BEU 4600	**San Benito-Monterey Unit** Tim Montgomery, Forester I 831-601-6547 Tim.Montgomery@fire.ca.gov	**MVU 3300**	**San Diego Unit** Eric Just, Forester II 619-592-1224 Eric.Just@fire.ca.gov	**TCU 4400**	**Tuolumne-Calaveras Unit** Gary Whitson, Forester II 209-419-4406 Gary.Whitson@fire.ca.gov
FKU 4300	**Fresno-Kings Unit** Nick Kent, Forester II 559-246-4368 nick.kent@fire.ca.gov	**RRU 3100**	**Riverside Unit** Lynnette Short, Forester II 951-623-3424 Lynnette.Short@fire.ca.gov	**TUU 4100**	**Tulare Unit** David Shy, Forester II 559-280-5077 David.Shy@fire.ca.gov

Last updated **September 6, 2024**. Please send informational updates or changes to Shawn.Headley@fire.ca.gov

CDFW 2024 Wildfires Habitats and Special Status Species Impacted by Fire Name, Watershed, and County and CDFW Species-Specific Measures

Updated on 10/25/2024

As indicated in the California Wildfires Environmental Protection Plan (EPP) BMP 1.6.1 (CDFW) Fire-Specific Measures, this Exhibit is updated regularly and supersedes previous versions. For the most recent version of this document, please contact Jeanette Griffin at Jeanette.Griffin@wildlife.ca.gov

The species included in this summary are intended as a guide and are not comprehensive, please consult with the appropriate California Department of Fish and Wildlife (CDFW) Cal OES contact below for up-to-date information. To determine your contact, reference the CDFW Regions Map.

CDFW Cal OES Contacts by Region

Region	Contact Name	Contact Email	Contact Phone
Northern	Jamie Galos	John.Galos@wildlife.ca.gov	(530) 605-6166
North Central	Sarah Lose	Sarah.Lose@wildlife.ca.gov	(916) 747-5226
Bay Delta	Julie Coombes	Julie.Coombes@wildlife.ca.gov	(707) 576-2825
Central	Margarita Gordus	Margarita.Gordus@wildlife.ca.gov	(559) 207-6681
South Coast	Jennifer Blackhall	Jennifer.Blackhall@wildlife.ca.gov	(858) 354-3285
Inland Deserts	Edith Martinez	Edith.Martinez@wildlife.ca.gov	(909) 239-1241
Headquarters	Jeanette Griffin	Jeanette.Griffin@wildlife.ca.gov	(916) 720-1233

The species included in this summary are the California Endangered Species Act (CESA) listed species, CESA Candidate species, CDFW Species of Special Concern, CDFW Fully Protected species, CDFW Watch List species, California Board of Forestry Sensitive Species, as well as plant species protected under the Native Plant Protection Act (NPPA) and plant species with California Rare Plant Ranks 1B.1, 1B.2, and 1B.3. **Species with fire-specific Best Management Practices, or BMPs, are listed in bold font.**

This list does not include solely Federally protected species. To ensure compliance with federal regulations those species should be determined based on the federal Endangered Species Act with guidance from the U.S. Fish and Wildlife Service.

For more information on species conservation status, please refer to CDFW's Special Animals List https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline, CDFW's Special Vascular Plants, Bryophytes, and Lichens List https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline, and CDFW's Fully Protected Animals list https://wildlife.ca.gov/Conservation/Fully-Protected.

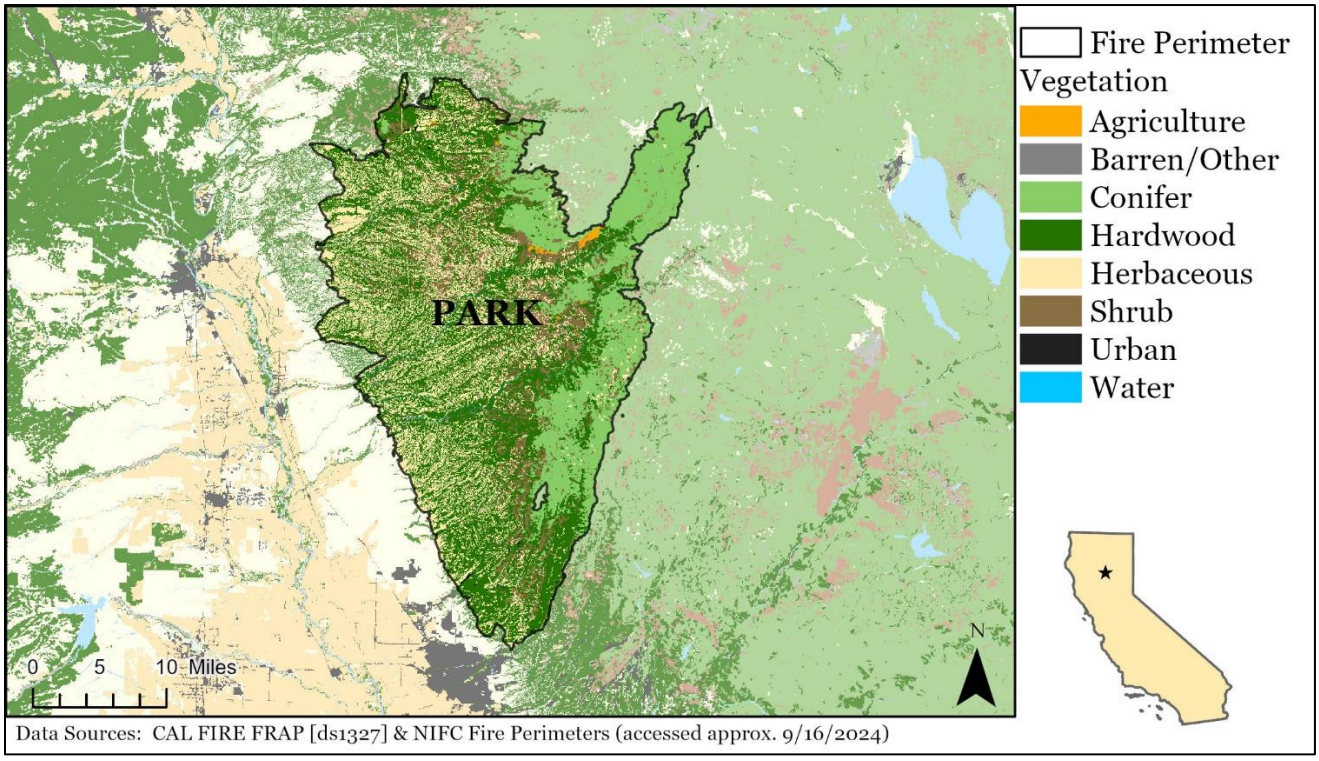
Contents

2024 Fire-Specific Impact Summaries

Fire Name: Park Fire
Containment: 100% as of 10/1/2024 (FINAL)
CDFW Region: Northern and North Central regions
CDFW Contact: Jamie Galos – Northern Region, Sarah Lose – North Central Region
Counties: Tehama and Butte counties, respectively
Acres Burned: 429,603 acres

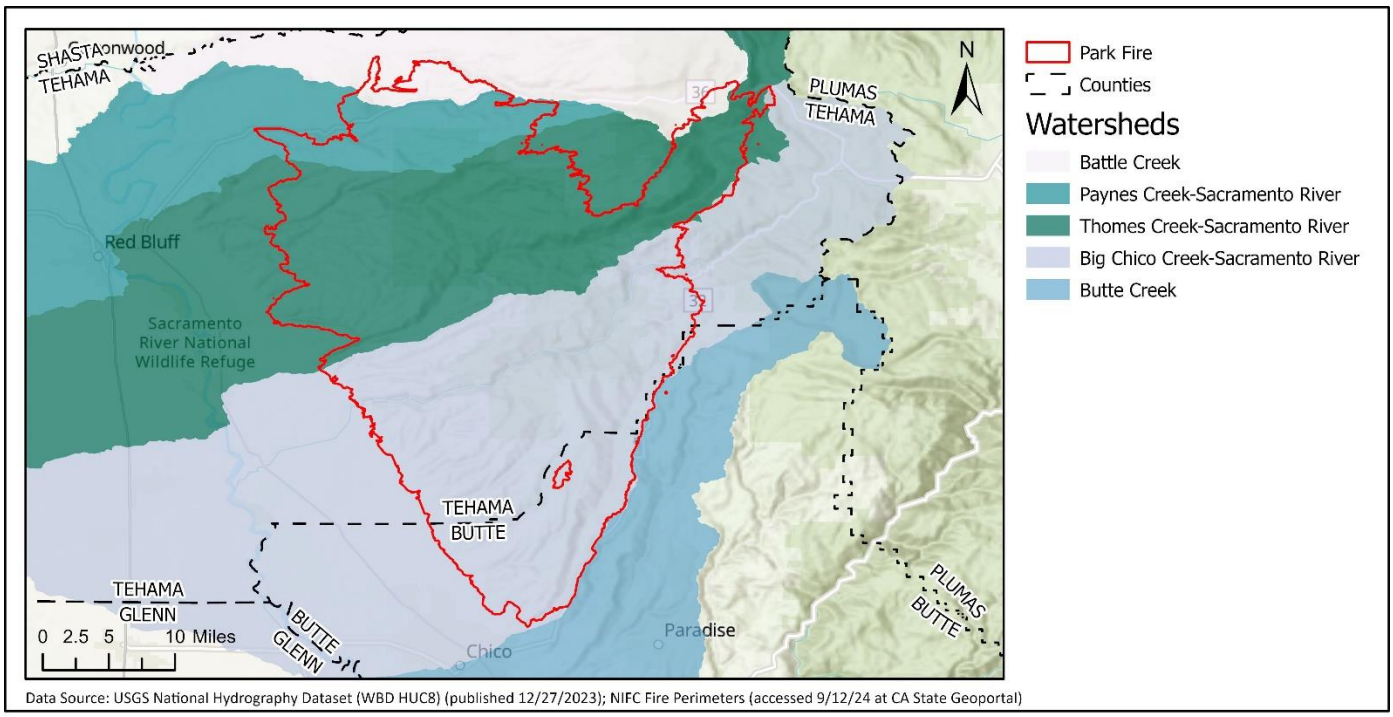
Dominant Habitat Types:

- Hardwood – 180,366 acres with Blue Oak Woodland (82,783 ac), Blue Oak-Foothill Pine (49,861 ac), Montane Hardwood (43,826 ac), Valley Foothill Riparian (2,512 ac), Valley Oak Woodland (954 ac), Coastal Oak Woodland (328 ac), Aspen (62 ac), Montane Riparian (41 ac)
- Herbaceous – 102,043 acres with Annual Grassland (100,777 ac), Perennial Grassland (1,081 ac), Fresh Emergent Wetland (114 ac), Wet Meadow (47 ac), Pasture (25 ac)
- Conifer – 89,130 acres with Sierran Mixed Conifer (47,584 ac), Ponderosa Pine (28,596 ac), Montane Hardwood-Conifer (8,158 ac), White Fir (3,089 ac), Closed-Cone Pine-Cypress (441 ac), Douglas Fir (336 ac), Jeffrey Pine (333 ac), Red Fir (298 ac), Eastside Pine (150 ac), Juniper (133 ac), Lodgepole Pine (11 ac)
- Shrub – 52,663 acres with Mixed Chaparral (44,216 ac), Montane Chaparral (7,425 ac), Sagebrush (865 ac), Montane Riparian (109 ac), Valley Foothill Riparian (48 ac)
- Barren/Other – 2988 acres
- Agriculture – 1,272 acres with Evergreen Orchard (1,161 ac), Cropland (111 ac)
- Water – 1,272 acres with Riverine (641 ac), Lacustrine (63 ac)
- Urban – 456 acres



Species with Potential to Occur Throughout Park Fire:

- Amphibians: **California red-legged frog, foothill yellow-legged frog – north coast DPS, Sierra Nevada yellow-legged frog**
- Birds: bald eagle, **burrowing owl, golden eagle,** grasshopper sparrow, great gray owl, loggerhead shrike, long-eared owl, American goshawk, **northern harrier,** olive-sided flycatcher, tricolored blackbird, vaux's swift, white-tailed kite, yellow warbler, yellow-breasted chat, western yellow-billed cuckoo, greater sandhill crane
- Invertebrates:
  - Insects: **western bumble bee, Crotch's bumble bee**
- Mammals: American badger, fisher – west coast DPS**, gray wolf,** pallid bat, spotted bat, Townsend's big-eared bat, western mastiff bat, western red bat,
- Reptiles: coast horned lizard, **northwestern pond turtle, giant garter snake**



Additional Species/Resources with Potential to Occur by Watershed:

Battle Creek Watershed (Tehama County):

- Amphibians: **cascades frog**
- Birds: purple martin, **willow flycatcher**
- Forest: Northern Interior Cypress Forest
- Marsh**:** sphagnum bog
- Mammals: **Sierra Nevada red fox – southern Cascades DPS**, Sierra Nevada snowshoe hare, wolverine
- Plants:
  - Dicots: long-leaved starwort, Shasta clarkia, woolly meadowfoam
  - Ferns: Mingan moonwort

Paynes Creek-Sacramento River Watershed (Tehama County):

- Amphibians: **cascades frog**
- Birds: **willow flycatcher**

- Fish: **steelhead – Central Valley DPS**
- Forest: Northern Interior Cypress Forest
- Invertebrates:
  - Insects: valley elderberry longhorn beetle
- Plants:
  - Dicots: Shasta clarkia, watershield, woolly meadowfoam
  - Monocots: Butte County fritillary, Callahan's mariposa-lily

Thomes Creek-Sacramento River Watershed (Tehama County):

- Amphibians: **cascades frog,** western spadefoot
- Birds: American goshawk, purple martin, short-eared owl, Swainson's hawk, **willow flycatcher**
- Fish: **chinook salmon – Central Valley spring-run ESU, steelhead – Central Valley DPS**
- Inland Waters: Central Valley Drainage Fall Run Chinook Stream, Central Valley Drainage Hardhead/Squawfish Stream, Central Valley Drainage Spring-Run Chinook Stream
- Mammals: pallid bat, **Sierra Nevada red fox – southern Cascades DPS,** Sierra Nevada snowshoe hare, Townsend's big-eared bat, wolverine
- Plants:
  - Dicots: Hall's rupertia, long-striped campion, silky cryptantha, white-stemmed clarkia, woolly meadowfoam
  - Ferns: Mingan moonwort, scalloped moonwort, western goblin
  - Monocots: Butte County fritillary, Callahan's mariposa-lily

Big Chico Creek-Sacramento River Watershed (Tehama and Butte counties):

- Amphibians: western spadefoot
- Birds: California black rail**, purple martin, short-eared owl,** Swainson's hawk, **willow flycatcher,** yellow-headed blackbird
- Fish: **chinook salmon – Central Valley spring-run ESU, steelhead – Central Valley DPS**
- Herbaceous: Northern Volcanic Mud Flow Vernal Pool
- Inland Waters: Central Valley Drainage Hardhead/Squawfish Stream, Central Valley Drainage Spring-Run Chinook Stream
- Lichens: Siskiyou jellyskin lichen
- Mammals: **Sierra Nevada red fox – southern Cascades DPS**
- Plants:
  - Dicots: Baker's globe mallow, Butte County checkerbloom, Butte County meadowfoam, Butte County morning-glory, Hall's rupertia, Mildred's clarkia, silky cryptantha, white-stemmed clarkia, woolly meadowfoam, woolly rose-mallow
  - Monocots: adobe-lily, California beaked-rush, California satintail, Callahan's mariposa-lily, Red Bluff dwarf rush

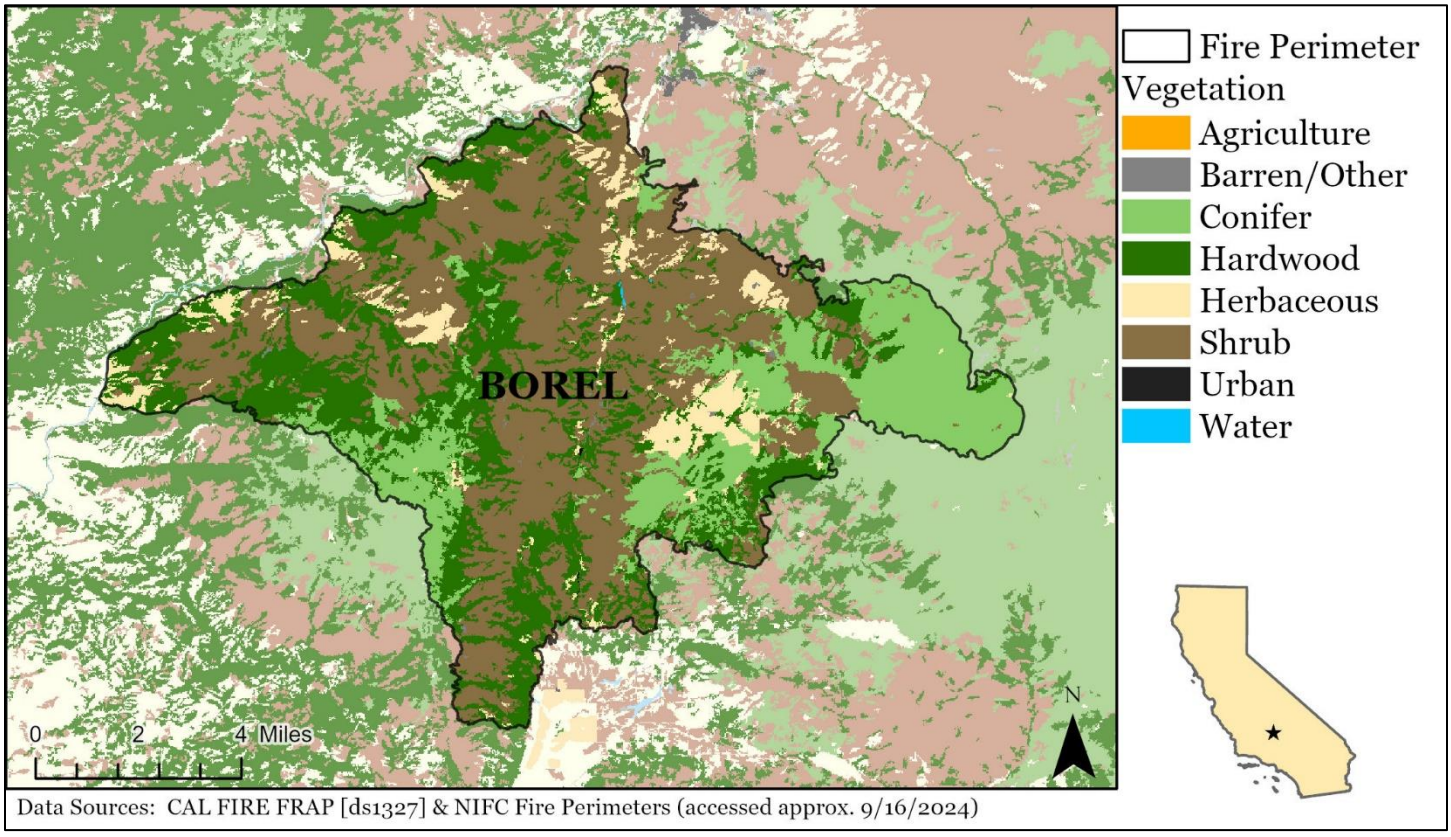
Butte Creek Watershed (Butte County):

- Amphibians: **cascades frog**, western spadefoot
- Birds: purple martin, short-eared owl
- Plants:
  - Dicots: Butte County checkerbloom, Butte County morning-glory, Hall's rupertia, white-stemmed clarkia

Fire Name: Borel Fire
Containment: 100% as of 9/16/2024 (FINAL)
CDFW Region: Central Region
CDFW Contact: Margarita Gordus
Counties: Kern County
Acres Burned: 59,288 acres

Dominant Habitat Types:

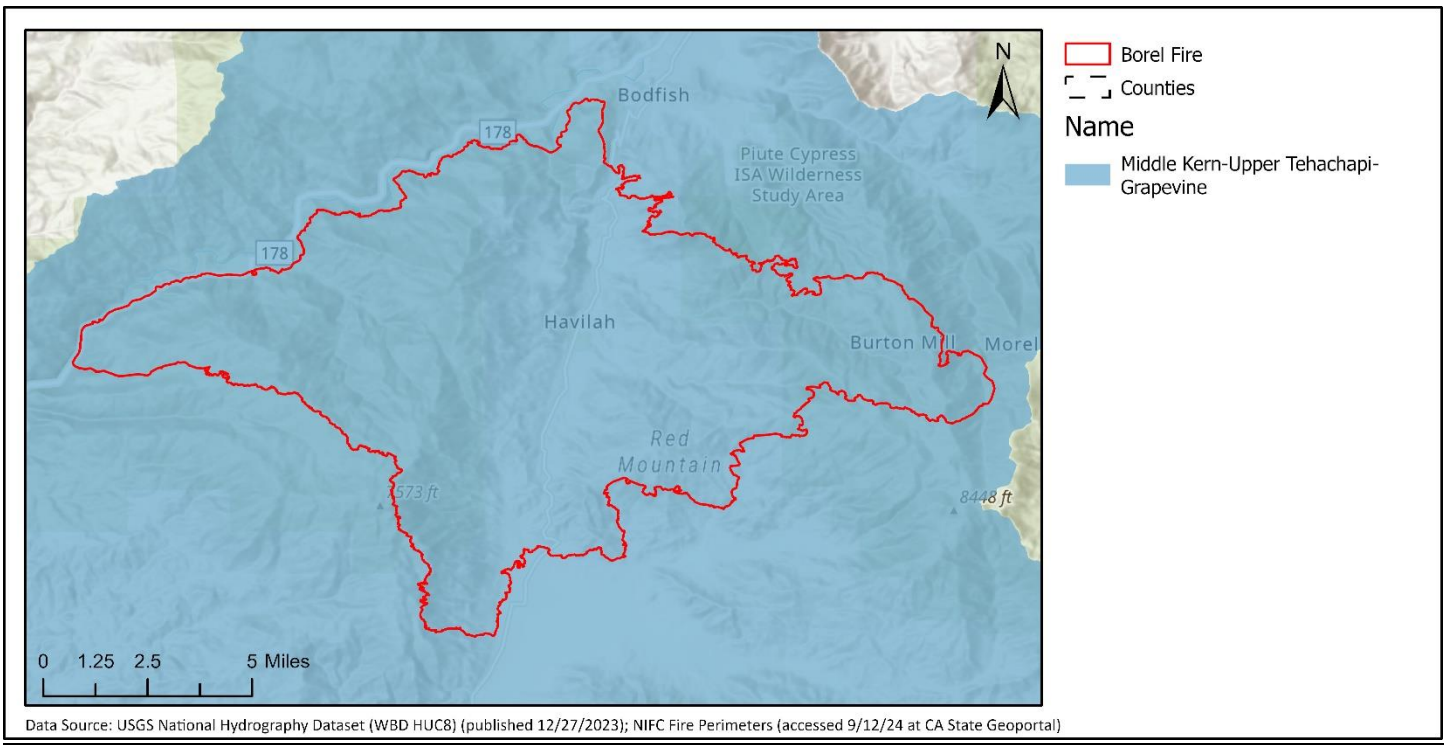
- Shrub – 26,221 acres with Mixed Chaparral (24,557 ac), Montane Chaparral (1,508 ac), Sagebrush (157 ac)
- Hardwood – 17,505 acres with Montane Hardwood (12,445 ac), Blue Oak-Foothill Pine (3,012 ac), Blue Oak Woodland (1,940 ac), Valley Foothill Riparian (68 ac), Montane Riparian (40 ac)
- Conifer – 11,179 acres with Jeffrey Pine (3,276 ac), Sierran Mixed Conifer (3,241 ac), Montane Hardwood-Conifer (1,788 ac), Pinyon-Juniper (1,739 ac), Ponderosa Pine (801 ac), Juniper (306 ac), White Fir (22 ac), Closed-Cone Pine-Cypress (6 ac)
- Herbaceous – 4,197 acres with Annual Grassland (4,196 ac), Perennial Grassland (1 ac)
- Barren/Other – 163 acres
- Water – 18 acres with Riverine (17 ac), Lacustrine (1 ac)
- Urban – 10 acres



Species/Resources with Potential to Occur Throughout Borel Fire:

- Amphibians: **Foothill yellow-legged frog – south Sierra DPS, southern mountain yellow-legged frog, southern long-toed salamander, Kern Canyon slender salamander, relictual slender salamander**

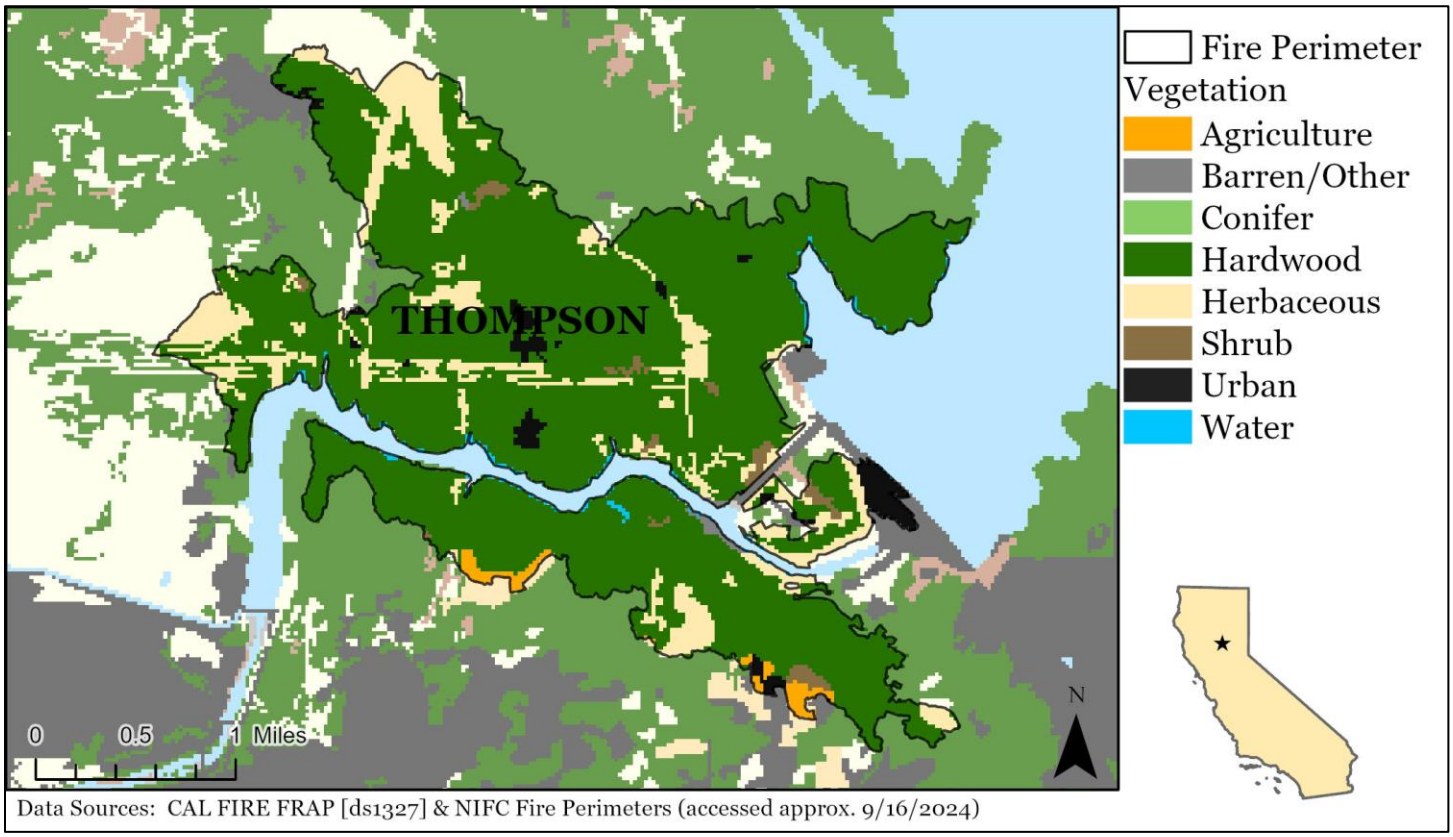
- Birds: **American goshawk, bald eagle**, **burrowing owl**, **California condor**, **golden eagle**, **grasshopper sparrow**, **loggerhead shrike, long-eared owl, northern harrier**, **olive-sided flycatcher**, **purple martin**, **short-eared owl**, **southwestern willow flycatcher,** Swainson's hawk, **tricolored blackbird, white-tailed kite**, **willow flycatcher, yellow warbler**
- Forest: Southern Interior Cypress Forest
- Invertebrates:
  - Insects: **Crotch's bumble bee, Kern primrose sphinx moth**
- Mammals: American badger**, fisher – southern Sierra Nevada DPS,** pallid bat, **San Joaquin kit fox,** spotted bat, Townsend's big-eared bat, western mastiff bat, western red bat
- Plants:
  - Dicots: Baja navarretia, Breedlove's buckwheat, calico monkeyflower, Kern Canyon clarkia, Kern Plateau bird's-beak, Kern River evening-primrose, Piute Mountains navarretia, rose-flowered larkspur, Shevock's golden-aster, southern Sierra monardella, Tracy's eriastrum, unexpected larkspur
  - Gymnosperms: Piute cypress
  - Monocots: Palmer's mariposa-lily
- Reptiles: **California legless lizard (all *Anniella* spp), coast horned lizard, northern California legless lizard, northwestern pond turtle, southern California legless lizard, southern rubber boa**



Fire Name: Thompson Fire
Containment: 100% as of 7/8/2024 (FINAL)
CDFW Region: North Central Region
CDFW Contact: Sarah Lose
Counties: Butte County
Acres Burned: 3,789 acres

Dominant Habitat Types:

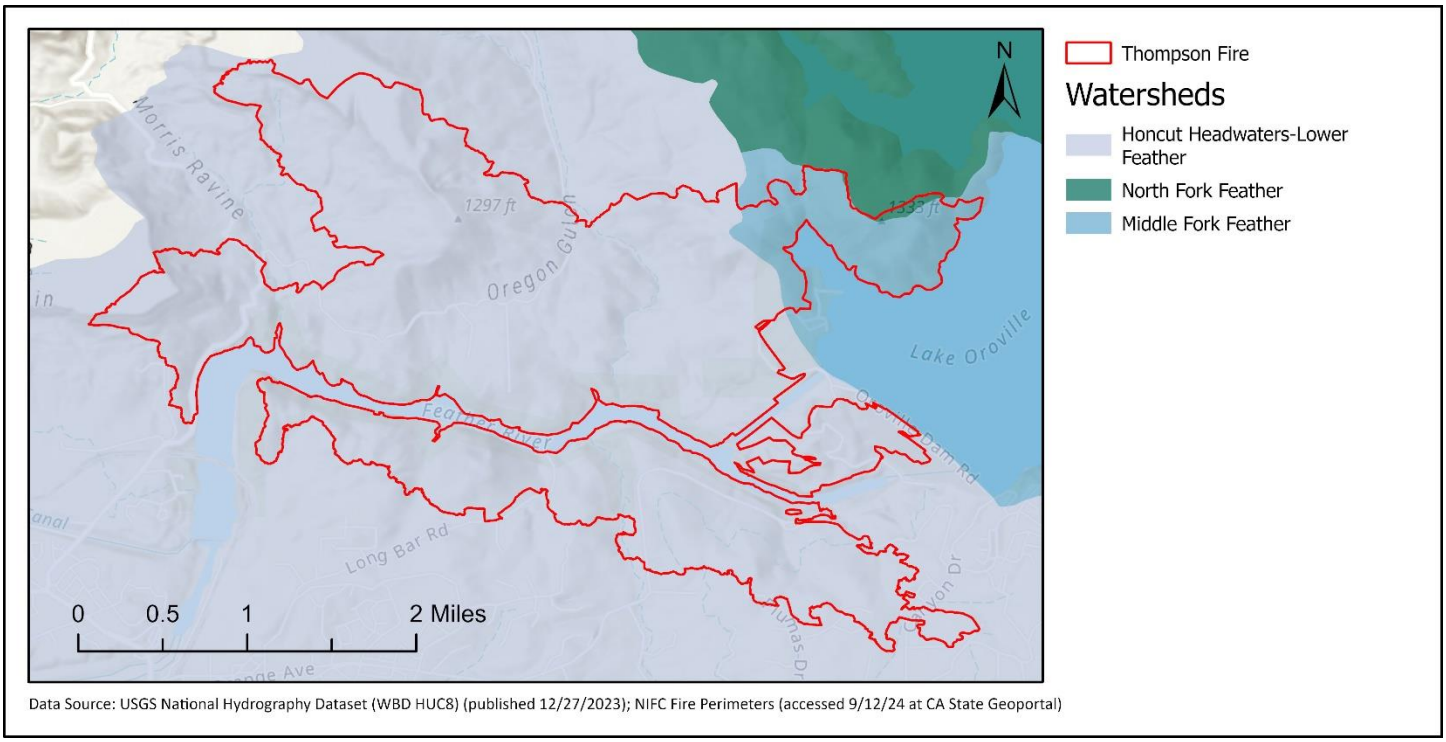
- Hardwood – 3,055 acres with Blue Oak Woodland (2,151 ac), Blue Oak-Foothill Pine (877 ac), Valley Foothill Riparian (18 ac), Montane Hardwood (8 ac)
- Herbaceous – 506 acres of Annual Grassland
- Urban – 92 acres
- Shrub – 51 acres with Mixed Chaparral (40 ac), Valley Foothill Riparian (10 ac)
- Agriculture – 40 acres of Cropland
- Water – 32 acres of Lacustrine
- Barren/Other – 11 acres



Species with Potential to Occur Throughout Thompson Fire:

- Amphibians: **California red-legged frog**, **foothill yellow-legged frog – Feather River DPS**, western spadefoot
- Birds: bald eagle, **burrowing owl,** common loon, **golden eagle,** grasshopper sparrow, loggerhead shrike, long-eared owl, **northern harrier,** short-eared owl, **tricolored blackbird, willow flycatcher,** white-tailed kite, yellow warbler, yellow-breasted chat
- Invertebrates:
  - Insects: **western bumble bee, Crotch's bumble bee**

- Mammals: **Gray wolf,** American badger, pallid bat, spotted bat, Townsend's big-eared bat, western mastiff bat, western red bat
- Reptiles: **coast horned lizard, northwestern pond turtle**



Additional Species/Resources with Potential to Occur by Watershed:

Honcut Headwaters Lower Feather Watershed:

- Birds: American white pelican, bank swallow, osprey, redhead, Swainson's hawk, yellow-headed blackbird
- Fish: **chinook salmon – Central Valley spring-run ESU, chinook salmon – Central Valley fall-run ESU, steelhead – Central Valley DPS**
- Plants:
  - Dicots: Brandegee's clarkia, Butte County golden clover, pink creamsacs
  - Monocots: Red Bluff dwarf rush
- Reptiles: **giant gartersnake**

North Fork Feather Watershed:

- Birds: Barrow's goldeneye

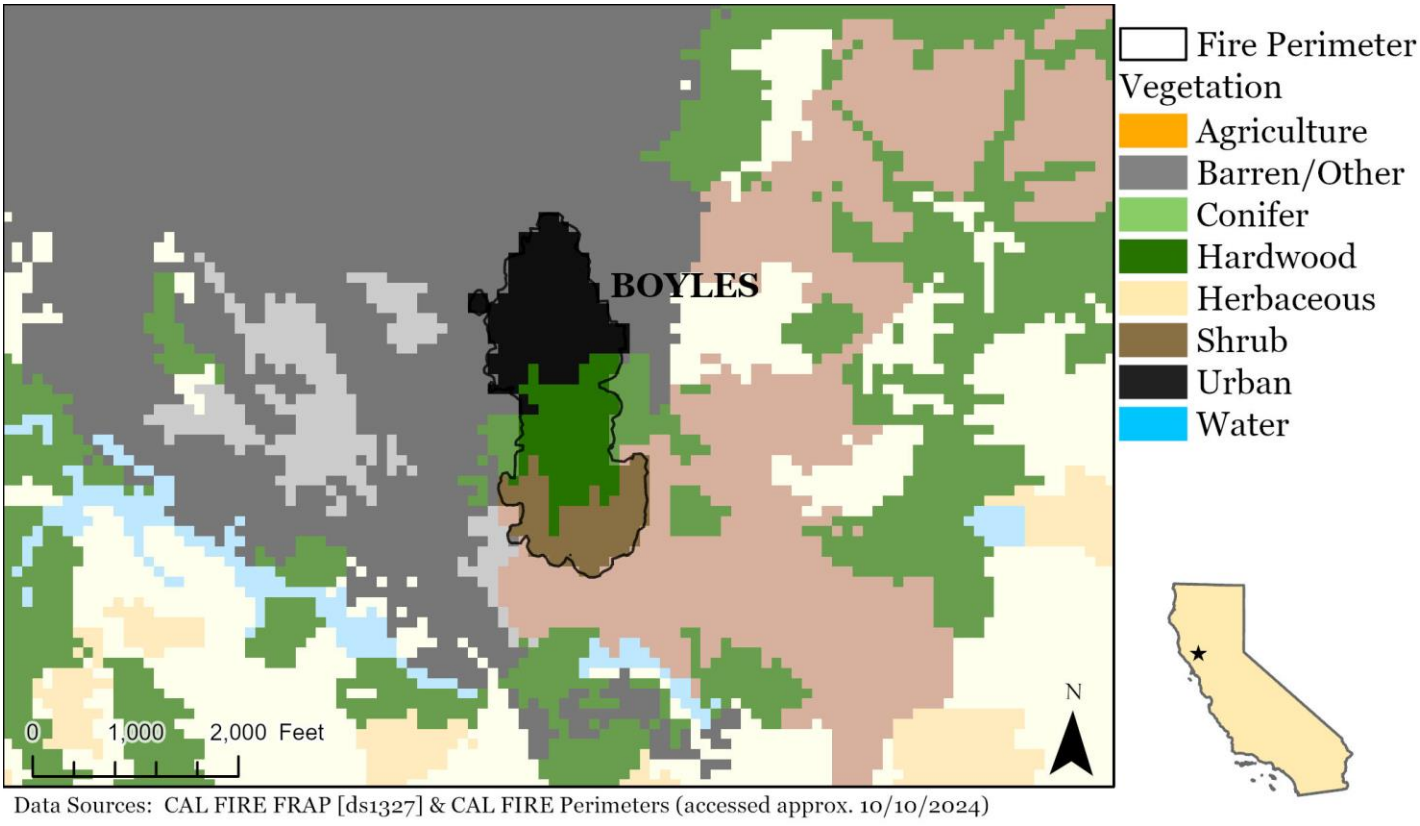
Middle Fork Feather Watershed:

- Amphibians: **Sierra Nevada yellow-legged frog**
- Birds: Barrow's goldeneye

Fire Name: Boyles Fire
Containment: 100% as of 7/8/2024 (FINAL)
CDFW Region: North Central Region
CDFW Contact: Sarah Lose
Counties: Butte County
Acres Burned: 3,789 acres

Dominant Habitat Types:

- Urban – 36 acres
- Hardwood – 25 acres with Blue Oak-Foothill Pine
- Shrub – 22 acres with Chamise-Redshank Chaparral
- Barren – 1 acres



Data Sources: CAL FIRE FRAP [ds1327] & CAL FIRE Perimeters (accessed approx. 10/10/2024)

Species/Resources with Potential to Occur Throughout Boyles Fire:

- Invertebrates:
  - Insects: **American bumble bee**

Species-Specific Measures

- The following measures are to be used in concert with the AMMs and BMPs found in the EPP, specifically Section 8: Fish and Wildlife Protection BMPs.
- During project scoping, if a species listed under the fire impact summary is determined to potentially occur within the work area, then the relevant measures in this Exhibit should be implemented, with the following considerations:
    - When a species is both federal and state listed as a Threatened, Endangered, or Proposed/Candidate species, and avoidance and minimization measures (AMMs) **have** been provided by the U.S. Fish and Wildlife Service (USFWS), those measures take precedence over measures listed in the EPP and this Exhibit.
    - When a species is both federal and state listed as a Threatened, Endangered, or Proposed/Candidate species, and AMMs **have not** been provided by the USFWS, use the measures provided in the EPP and this Exhibit.
    - When a species is only state listed as a Threatened, Endangered, Candidate, or Species of Special Concern, use the measures provided in the EPP and this Exhibit.
    - When there is no species-specific measure provided, indicated by lack of bold font in the fire impact summary, use the group-specific measure provided in the EPP.

2.4.1 Amphibian Species Measures.

2.4.1.1 All identified salamander species (Borel Fire): If work needs to be conducted within or adjacent to suitable salamander habitat the qualified biologist should conduct a visual encounter survey within the work area prior to activities. If salamanders are discovered, a 50-foot disturbance-free buffer should be established around the occurrence. If avoidance of the occurrence and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures. If feasible avoidance measures are not possible, relocation of the listed salamanders is allowed with CDFW coordination and adherence to EPP measure 8.9.3.

2.4.1.2 All listed yellow-legged frog species (All *Rana boylii* clades) (All Fires): If work needs to be conducted within or adjacent to suitable yellow-legged frog habitat the qualified biologist should conduct a visual encounter survey for yellow-legged frogs in any life stage within the work area no more than 5 days prior to activities. If frogs in any life stage are discovered, a 50-foot disturbance-free buffer should be established around the occurrence. If avoidance of the occurrence and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures. If feasible avoidance measures are not possible, relocation of the listed yellow-legged frogs is allowed with CDFW coordination and adherence to EPP measure 8.9.3.

2.4.1.3 California Red-legged Frog (Park and Thompson Fires): If work needs to be conducted within or adjacent to suitable CA red-legged frog habitat the qualified biologist should conduct a visual encounter survey for frogs in any life stage within the work area no more than 5 days prior to activities. If frogs in any life stage are found, a 50-foot disturbance-free

buffer should be established around the occurrence. If avoidance of the occurrence and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures. If feasible avoidance measures are not possible, relocation of CA red-legged frogs is allowed with CDFW coordination and adherence to EPP measure 8.9.3.

2.4.1.4 Cascades Frog (Park Fire): If work needs to be conducted within or adjacent to suitable Cascades frog habitat the qualified biologist should conduct a visual encounter survey for frogs in any life stage within the work area no more than 5 days prior to activities. If frogs in any life stage are found, a 50-foot disturbance-free buffer should be established around the occurrence. If avoidance of the occurrence and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures. If feasible avoidance measures are not possible, relocation of Cascades frogs is allowed with CDFW coordination and adherence to EPP measure 8.9.3.

2.4.2 Bird Species Measures.

2.4.2.1 Bald Eagle, Golden Eagle, California Condor (Borel Fire) and Golden Eagle (Park and Thompson Fires): If work needs to be conducted during eagle breeding and nesting season, generally February 15 to August 31, and suitable nesting habitat exists within or adjacent to the work area, the qualified biologist should conduct visual encounter surveys for active nests no more than 10 days prior to the start of activities. If an active nest is discovered, a ½ mile disturbance-free buffer around the nest should be established until the qualified biologist or CDFW contact determine the nest has failed or the young have fledged. If avoidance of the occurrence and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures.

2.4.2.2 Northern Harrier and American Goshawk (Park, Thompson, and Borel Fires): If work needs to be conducted during northern harrier and American goshawk breeding and nesting season, generally February through October, and suitable nesting habitat exists within or adjacent to the work area, the qualified biologist should conduct visual encounter surveys for active nests no more than 10 days prior to the start of activities. If an active nest is discovered, a ¼ mile disturbance-free buffer around the nest should be established until the qualified biologist or CDFW contact determine the nest has failed or the young have fledged. If avoidance of the occurrence and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures.

2.4.2.3 Burrowing Owl (All fires): If work needs to be conducted during burrowing owl breeding and nesting season, generally February – August 31, and suitable habitat exists within or adjacent to the work area, the qualified biologist should inspect the work area for occupied burrows no more than 10 days prior to the start of activities. If active burrows are discovered a disturbance-free buffer around the burrow(s) should be established using the table below, until the qualified biologist or CDFW contact determine the nest has failed or the young have fledged and are capable of independent survival. If avoidance of the occurrence and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures.

Location	Time of Year	Level of Disturbance		
		Low	Med	High
Nesting sites	April 1-Aug 15	200 m*	500 m	500 m
Nesting sites	Aug 16-Oct 15	200 m	200 m	500 m
Nesting sites	Oct 16-Mar 31	50 m	100 m	500 m

* meters (m)

Recommended restricted activity dates and buffer distances by level of disturbance for burrowing owls (Scobie and Faminow 2000) from Staff Report on Burrowing Owl Mitigation (CDFW, 2012). One meter = 3.28 feet.

2.4.2.4 White-tailed kite (Borel Fire): If work needs to be conducted during white-tailed kite breeding and nesting season, generally February through October and suitable nesting habitat exists within or adjacent to the work area, the qualified biologist should conduct visual encounter surveys for active nests no more than 10 days prior to the start activities. If an active nest is discovered, a ½-mile disturbance-free buffer should be established around the active nest until the qualified biologist or CDFW contact determines nesting has ceased or the young have fledged. If avoidance of the nest and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures.

2.4.2.5 Tricolored blackbird (Borel Fire): If work needs to be conducted during tricolored blackbird breeding and nesting season, generally February 1 to September 15, and suitable nesting habitat exists within or adjacent to the work area, the qualified biologist should conduct visual encounter surveys for active nests and colonies no more than 10 days prior to the start of activities. If an active nest or colony is discovered, a 300-foot disturbance-free buffer should be established around the nest or colony until the qualified biologist or CDFW contact determine nesting has ceased or the young have fledged and are capable of independent survival. If avoidance of the nest/colony and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures.

2.4.2.6 Long-eared owl, short-eared owl, yellow warbler, grasshopper sparrow, loggerhead shrike, olive-sided flycatcher, purple martin (Borel Fire): If work needs to be conducted during nesting season, generally February 1 to mid-September, and suitable nesting habitat exists within or adjacent to the work area, the qualified biologist should conduct visual encounter surveys for active nests no more than 10 days prior to the start of activities. If an active nest is discovered, a 250-foot disturbance-free buffer should be established around the active nest of non-raptor species, and a 500-foot disturbance-free buffer established around the active nest of raptor species until the qualified biologist or CDFW contact determines that the birds have fledged and are no longer reliant upon the nest or parental care for survival. If avoidance of the nest/colony and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures.

2.4.2.7 Willow Flycatcher (Park, Thompson, and Borel Fires): If work needs to be conducted during willow flycatcher breeding and nesting season, generally February 1 through mid-September, and suitable riparian habitat for the willow flycatcher exists within or adjacent to the work area, the qualified biologist should conduct visual encounter surveys for active nests no more than 10 days prior to the start of activities. If an active nest is discovered, a

300-foot disturbance-free buffer around the active nest until the qualified biologist or CDFW contact determines that nesting has ceased or the young have fledged. If avoidance of the nest and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures.

2.4.2.8 Southwest willow flycatcher (Borel Fire): If work needs to be conducted during nesting season, generally between May 1 to August 31, and suitable southwestern willow flycatcher habitat exists within or adjacent to the work area, the qualified biologist should conduct visual encounter surveys for active nests no more than 10 days prior to the start of activities. If an active nest is discovered, a ¼ mile disturbance-free buffer should be established around the active nest until the qualified biologist or CDFW contact determines that the birds have fledged and are no longer reliant upon the nest or parental care for survival. If avoidance of the nest/colony and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures.

2.4.3 Fish Species Measures:

2.4.3.1 Steelhead and chinook salmon – all ESUs (Park and Thompson Fires): In watercourses with known anadromy with existing Class I low water crossings or Class I fords with flowing water present, the qualified biologist should inspect the immediate crossing location for spawning or rearing habitat prior to use. If active spawning or rearing habitat is present, it should be avoided until determined to be out of use by the qualified biologist. If active spawning or rearing habitat is present and in use, and cannot be avoided, contact CDFW to coordinate on feasible avoidance measures

2.4.4 Invertebrate Species Measures:

2.4.4.1 All bumble bee species (All Fires): If work needs to be conducted between February and September, the work area is within the historical range of Crotch's bumble bee and western bumble bee, and suitable forage habitat is present within or adjacent to the work area, the qualified biologist should inspect the work area for existing ground hives or signs that a bumble bee hive is present no more than 10 days prior to the start of work activities. If a bumble beehive is discovered in the work area, a 50-foot avoidance buffer should be established around the nest. If avoidance of the hive and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures.

2.4.4.2 Kern primrose sphinx moth (Borel Fire): Avoid evening primroses, suncups and related species (Camissonia spp.) with establishing a 25-foot buffer, if feasible.

2.4.5 Mammal Species Measures:

2.4.5.1 Fisher – southern Sierra Nevada DPS (Borel Fire): If work needs to be conducted during the fisher natal or maternal denning period, generally March to August, and suitable fisher habitat exists within or adjacent to the work area, the qualified biologist should conduct a visual inspection of the work area no more than 10 days prior to the start of activities for potential natal/maternal habitat and denning sites. If potential denning structures are discovered, a ¼ mile disturbance-free buffer should be established around the site until the

qualified biologist or CDFW contact determine the site is not occupied. If avoidance of the occurrence and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures.

2.4.5.2 Gray Wolf (Park and Thompson Fires): If a gray wolf den or rendezvous site is discovered within or adjacent to the work area, a ¼ mile disturbance-free buffer should be established around the site and CDFW be contacted to report the discovery. If avoidance of the occurrence and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures. Any incidental wolf sighting should be reported to CDFW within 24 hours of the sighting.

2.4.5.3 Sierra Nevada Red Fox – southern Cascades DPS (Park Fire). If a Sierra Nevada red fox den is discovered within or adjacent to the work area, a 200-foot disturbance-free buffer should be established around the site and CDFW contacted to report the discovery. If avoidance of the occurrence and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures.

2.4.5.4 San Joaquin kit fox (Borel Fire): The qualified biologist should determine if suitable denning habitat is present within or adjacent to the work area. If suitable habitat is present, the qualified biologist should conduct an inspection to determine if an occupied den is present no more than 14 days prior to the start of activities. If an active den is discovered, a 100-foot disturbance-free buffer should be established around the den. If it cannot be determined if the den is active, then a 50-foot disturbance-free buffer should be established. If avoidance of the den and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures.

Potential den	50 feet
Atypical den	50 feet
Known den	100 feet
Natal/pupping den (occupied and unoccupied)	Contact CDFW or USFWS

Recommended exclusion zone buffer distance minimums from *USFWS Standard Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (Sacramento USFWS Office, 2011).

2.4.6 Reptile Species Measures

2.4.6.1 Coast horned lizard (Borel Fire): If work needs to be conducted within or adjacent to suitable coast horned lizard habitat, the qualified biologist should conduct a visual encounter survey for coast horned lizards within the work area no more than 10 days prior to activities. If coast horned lizards are discovered, a 50-foot disturbance-free buffer should be established around the occurrence. If avoidance of the occurrence and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures. If feasible avoidance measures are not possible, relocation of the coast horned lizard is allowed with CDFW coordination and adherence to EPP measure 8.9.3.

2.4.6.2 All Legless Lizard (*Anniella* spp) Species (Borel Fire): If work needs to be conducted within or adjacent to suitable legless lizard habitat, the qualified biologist should conduct a visual encounter survey for legless lizards within the work area no more than 10 days prior to activities. If legless lizards are discovered, a 50-foot disturbance-free buffer should be established around the occurrence. If avoidance of the occurrence and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures. If feasible avoidance measures are not possible, relocation of the legless lizard(s) is allowed with CDFW coordination and adherence to EPP measure 8.9.3.

2.4.6.3 Northwestern Pond Turtle (Park, Thompson, and Borel Fires): If work needs to be conducted within or adjacent to suitable northwestern pond turtle habitat, the qualified biologist should conduct a visual encounter survey for northwestern pond turtles within the work area no more than 10 days prior to activities. If northwestern pond turtles in any life stage, including nests or hatchlings, are discovered, a 25-foot disturbance-free buffer should be established around the occurrence. If avoidance of the occurrence and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures. If feasible avoidance measures are not possible, relocation of the northwestern pond turtle/s is allowed with CDFW coordination and adherence to EPP measure 8.9.3.

2.4.6.4 Southern rubber boa (Borel Fire): If work needs to be conducted within or adjacent to suitable southern rubber boa habitat, the qualified biologist should conduct a visual encounter survey for southern rubber boa within the work area no more than 10 days prior to activities. If southern rubber boa is discovered, a 50-foot disturbance-free buffer should be established around the occurrence. If avoidance of the occurrence and/or a buffer cannot be established without impacting work, contact CDFW to coordinate on feasible avoidance measures. If feasible avoidance measures are not possible, relocation of the southern rubber boa is allowed with CDFW coordination and adherence to EPP measure 8.9.3.

2.4.6.5 Giant garter snake (Butte County portion within Park and Thompson Fires): If work needs to be conducted during giant garter snake's active period, generally May 1 to October 1, and within or adjacent to suitable giant garter snake habitat, generally defined as aquatic habitat present in Butte County and within 200 feet of supported upland habitat, the qualified biologist should conduct a daily clearance survey of the work area to ensure no giant garter snakes are present. If a giant garter snake is encountered, it should be allowed to leave the area. If the giant garter snake cannot or will not leave the area, relocation of the giant garter snake is allowed with CDFW coordination and adherence to EPP measure 8.9.3.

To: Wade Crowfoot
Secretary
California Natural Resources Agency

Date: 23 April 2021

From: Jared Blumenfeld
Secretary
California Environmental Protection Agency

Rachel Machi Wagoner
Executive Director
CalRecycle

Subject: **EMERGENCY WAIVER OF CERTAIN FOREST PRACTICE RULES IN SUPPORT OF HAZARD TREE REMOVAL RECOVERY OPERATIONS FOR THE 2018 CAMP FIRE & 2020 WILDFIRE RECOVERY OPERATIONS**

The Governor's Office of Emergency Services (CalOES) mission tasked the Department of Resources Recycling and Recovery (CalRecycle) to conduct structural debris and hazard tree removal following to the devastating wildfires that occurred across the State in 2018 and 2020. As part of that effort, CalRecycle requests the California Natural Resources Agency (CNRA), with the support of the California Department of Forestry and Fire Protection (CALFIRE), to waive certain Forest Practice Rules requirements (In-Lieu Practices, Emergency Notices, and Archaeological Requirements) to support multiple ongoing recovery operations.

CalRecycle makes this request pursuant to Governor's Executive Orders B-57-18, B-58-18,N-81-20 (Executive Orders), and any concurrent or subsequent proclamations or executive orders related to the 2020 fires. CalRecycle believes protocols developed to meet Federal Emergency Management Agency (FEMA) requirements, including but not limited to Stipulation II.B.2.v. of the FEMA/California Programmatic Agreement (FEMA Protocols) meet or exceed the intent of the subject Forest Practice Rules. By design and necessity, the FEMA Protocols rely on a system of continuous field monitoring, communication, consultations, reconnaissance, and documentation, supported by final reporting product(s). Whereas the Forest Practice Rules generally require upfront notifications to CALFIRE of the same or similar information. The requested waivers are intended to resolve this process incongruity and expedite recovery operations.

2018 CAMP FIRE & EXECUTIVE ORDER – HAZARD TREE REMOVAL
During November of 2018, the Camp Fire affected large areas of Butte County, destroyed over 12,000 structures, burned more than 300,000 trees, and resulted in 85 casualties. On November 14, 2018, the Governor issued Executive Order B-57-18, following with Executive Order B-58-18 suspending a variety of environmental

protection statutes as they relate to the wildfire recovery effort. Recovery Operations for this event is referred to as the State Hazard Tree Removal Program (DR-4407).

2020 FIRES (DR-4558 & DR-4569) & EXECUTIVE ORDER – HAZARD TREE REMOVAL
During July, August, and September of 2020, hundreds of wildfires raged across the state, many a direct result of over 14,000 dry lightning strikes during an August storm event. The fires destroyed over 10,000 structures across the state, and resulted in 31 casualties.

On September 25, 2020, the Governor issued Executive Order N-81-20 , suspending a variety of environmental protection statutes to the extent they would prevent, hinder, or delay certain wildfire recovery efforts. The Executive Order authorizes the Secretaries of the CalEPA and the CNRA to use their discretion to ensure the suspension serves the purpose of accelerating the removal and cleanup of debris from the fires and for implementing any restoration plan while at the same time protecting public health and the environment. They may do so by granting waivers or permits necessary for timber harvesting and for other actions necessary for the protection of public health and the environment. Recovery Operations for these events are ongoing in multiple counties throughout California and are referred to as Private Property Debris Removal for the 2020 Fires (DR-4558 and DR-4569). These Operations include a hazard tree removal function similar to the State Hazard Tree Removal Program for the 2018 Camp Fire (DR-4407).

> *This Order shall apply to but is not necessarily limited to: solid waste facility permits, waste discharge requirements for storage and disposal; emergency timber harvesting; stream environment zones; emergency construction activities; and waste discharge requirements and/or Water Quality Certification for discharges of fill material or pollutants. Boards, departments and offices within the California Environmental Protection Agency and the California Natural Resources Agency shall exercise their administrative discretion and expedite the granting of other authorizations, waivers or permits necessary for the removal, storage, transportation and disposal of hazardous and non-hazardous debris resulting from the fires, and for other actions necessary for the protection of public health and the environment.* [Executive Order N-81-20]

Separately, the Governor issued proclamations that either incorporated the Executive Order's suspension provisions by reference or that included identical provisions. This waiver is intended to apply to the State's 2020 fire disaster recovery efforts, authorized by Executive Order N-81-20, plus concurrent and subsequent proclamations and executive orders related to the 2020 fires.

FEMA PROTOCOLS SUMMARY
Current operations employ the following general tasks pursuant to the FEMA Protocols:

- Initial research on surveys and sites conducted and found in the past by contacting the local Archaeological Information Center for that data

- Networking with Native American Tribal Monitors for assistance in surveying and monitoring existing and newly discovered sites
- Collecting potential new site discoveries from biologist, arborist and forester conducting field work
- Conducting surveys within the project area.
    - Inputting that data into a data collection program.
    - All new and existing sites are considered significant on most projects.
    - Includes feature and site description, drawings, photos, measurements.
    - Collecting feature points lines and regions in Arc Collector.
- Forwarding that information to the Lead Archaeologists for the Operation
    - Lead Archaeologists develop protection measures and mitigations to preserve the integrity of the sites. Protection measures are discussed with tree removal contractors, to determine if hazard trees can be feasibly removed while maintaining the protection and integrity of features and sites.
- Field Archaeologist flag site boundaries immediately before commencement of operations within an assigned runway (project work area)
- Tribal Representatives are engaged and involved by being on site when tree removal operations are conducted near prehistoric archaeology sites.
- Tree removal contractors can ask monitors questions about removing trees adjacent to features and sites.
- After all field surveys are complete, contract archaeologist begin to compile California Department of Parks and Recreation (DPR) Primary Records, Site Records, Sketch Maps Linear Feature Records, District Records, and Location Maps.
- Final site records are sent to FEMA for Final Review and approval. FEMA refers to this process as an “After Action Plan”
- Final approved DPR records are submitted to the CA Office of Historic Preservation for distribution to the appropriate Information Center throughout the state.

CONFIDENTIAL ARCHAEOLOGICAL LETTER (CAL) WAIVER REQUEST

The Hazard Tree Removal Program (DR-4407) FEMA Protocols rely on adherence to an Archaeological Treatment Plan (ATP) developed with the support of the Federal Emergency Management Agency (FEMA) and in accordance with Stipulation II.B.2.v. of the FEMA/California Programmatic Agreement. Execution of the ATP meets or exceeds the minimum requirements administered by CALFIRE Archaeological Program as it relates to surveying, documenting, and protection of prehistoric and historic sites through avoidance, minimization, mitigation, and consultation with Federally Recognized Tribes. Further, ongoing Operations integrate consultation with California Tribes. Together, the ATPs and ongoing regular programmatic Operational coordination with California Tribes meets consultation requirements set forth by California Assembly Bill 52 (AB-52), and Executive Order B-10-11 (E.O. B-10-11). Tribal Partners are active, vital, and integral members supporting recovery efforts in the field. CalRecycle shall comply with the CalEPA Tribal Consultation Protocol.

Due to the rapid response timeframe, the 2020 Fire (DR-4558 & DR-4569) Operations are not supported by a formal ATP. Rather, standard operating procedures established by the Incident Management Teams and informed by conversations with CalRecycle contracted Registered Professional Forester(s) substantially follow similar requirements set forth in the FEMA Protocols for the State Hazard Tree Removal Program (DR-4407). The following document, administered via the terms and conditions in respective CalRecycle contracts, in aggregate represent the "FEMA Protocol" requirements for the 2020 Fire (DR-4558 &DR4569) Operations:

1. *Private Property Debris Removal for wildfires within multiple counties FEMA-4558-DR-CA and FEMA-4569-CA – Private Property Debris Removal Expedited Review for Emergency Undertakings Final Decision Regarding Treatment Measures to Resolve Potential Adverse Effects, in Accordance with Stipulation II.B.2.v. of the FEMA/California Programmatic Agreement*

PROCESS FOR DEMONSTRATION OF EQUIVALENT COMPLAINCE
To demonstrate compliance with the intent of the subject regulations, CalRecycle's contracted Registered Professional Forester(s) of record will prepare "Compliance Letters" describing measures employed to address the intent of the relevant Forest Practice Rules requirements. At a minimum, Compliance Letters address the following elements:

1. Acknowledge and affirm continued implementation of current Operational practices pursuant to the FEMA Protocols and Standard Operating Procedures for each recovery operation; and
2. Describe the consultation with the local CALFIRE Unit inspector as set forth in the 25 January 2021 CALFIRE memorandum, *Guidelines for the Removal of Federal Emergency Management Agency (FEMA) Hazard Trees under the Forest Practice Rules*.

REQUEST FOR WAIVER OF REGULATIONS
In accordance with the Executive Orders, CalRecycle requests waiver of the following "In Lieu Practices," "Emergency Notice," and "Confidential Archaeological Letter" regulations for the State Hazard Tree Removal Program (DR-4407) and Private Property Debris Removal for the 2020 Fires (DR-4558 and DR-4569):

1. Title 14 California Code of Regulation (14 CCR) sections 916.1, 936.1, 956.1 (et seq) In Lieu Practices [All Districts]. In rule sections where provision is made for site specific practices to be proposed by the RPF, approved by the Director and included in the THP in lieu of a stated rule, the RPF shall reference the standard rule, shall explain and describe each proposed practice, how it differs from the standard practice, and the specific locations where it shall be applied; and shall explain and justify how the protection provided by the proposed practice is at least equal to the protection provided by standard rule.;

2. Title 14 CCR section 1104.1(h) where in-lieu practices for Watercourse and lake protection zones as specified under Article 6 of the Forest Practice Rules (FPRs), exceptions to FPRs and alternative practices are not allowed, including the following:
    a. Bridging watercourses with trees that cannot be jacked and/or pulled away from the watercourse
    b. Operating equipment within the WLPZ in order to lift a bridged tree off the bed, bank or channel;
    c. Operating equipment within the WPLZ to conduct shovel logging (swing) and forwarder yarding operations;
    d. Permitting use of equipment within existing WLPZ landings; and
    e. Designated temporary crossings on all watercourse classes (temporary bridges, Spitler Crossings, Humboldt Crossing, Corrugated Log Crossings, Vented Rock Ford Crossings).
3. Title 14 CCR section 1052(a)(10) where a Confidential Archaeological Letter must be prepared for emergency notices 3 acres and larger. The FEMA Protocols are substantively equivalent to the CALFIRE Archaeological Program in terms of surveying, documenting, and protecting prehistoric and historic sites. The two strategies have different pathways to accomplish the same goals;
4. Title 14 CCR section 929.1 (949.1, 969.1)(f)(1)(B) (Emergency Notices of Less than 3 Acres) where a copy of the emergency notice must be sent to Native Americans;
5. Title 14 CCR section 929.1 (949.1, 969.1)(f)(3) (Emergency Notices of Less than 3 Acres) where Timber Operations are not allowed within the boundaries of any significant archaeological or historical sites as determined by the Registered Professional Forester (RPF) or the RPF's supervised designee;
6. Title 14 CCR section 929.2 (949.2, 969.2)(et seq.) – Protection measures for Plans and Emergency Notices 3 acres and Larger; and
7. Title 14 CCR section 929.3 (949.3, 969.3)(et seq.) – Post Review Site Discovery. The FEMA Protocols are substantively equivalent to the Cal Fire requirements as it relates to surveying, documenting, and protecting prehistoric and historic sites. Waiver of these regulations allows contract archaeologist to survey, record, implement immediate protection measures for sites and resources and finally report on new discoveries (i.e., Post Review Site Discovery).

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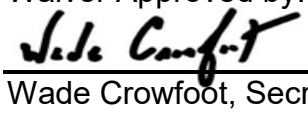
These waivers are necessary to suspend applicable procedural and substantive requirements, including notice and fee provisions that would otherwise delay hazard tree removal operations.

Waiver Approved by: 4/23/2021



Wade Crowfoot, Secretary Date

California Natural Resources Agency

Cc: Ken DaRosa, CalRecycle, Deputy Directory
Tina Walker, CalRecycle, Deputy Director Debris Recovery Operations

State of California **Natural Resources Agency**

M e m o r a n d u m

To: Regional Resource Managers

Date: January 25, 2021

Telephone: (916) 653-9422

Website: www.fire.ca.gov

Dennis Hall

From: Dennis Hall
Assistant Deputy Director
California Department of Forestry and Fire Protection (CAL FIRE)

Subject: Guidelines for the Removal of Federal Emergency Management Agency (FEMA) Hazard Trees under the Forest Practice Rules

As a result of the significant damage associated with wildfires last year, Cal Recycle and CalOES will be utilizing the services of Registered Professional Foresters and Licensed Timber Operators for the removal of FEMA hazard trees that threaten public assets or that are an imminent threat to Debris Removal Crews. The following guidelines on timber operations and appropriate noticing under the Forest Practice Rules are intended to help facilitate efficient hazard tree removal associated with this work. All timber operations associated with these projects are subject to the Rules and must be conducted in conformance with the Rules.

A list of Hazard Tree Removal Options for Cal Recycle has been attached for information. When a Post-Fire Recovery Exemption is submitted, it requires a signature by the Timberland Owner. A Right-of-Entry Permit (ROE) with the landowner's signature must be attached to satisfy this requirement. An example of a ROE is attached. Property Owners must complete an ROE Permit and provide the proper paperwork to enroll in the Government Program.

As necessary, the Units shall ensure all operational provisions of the Rules are being adhered to during operations. Please ensure all Unit Forest Practice Inspectors and Region Review Team staff receive a copy of this memo. If you have any questions regarding CAL FIRE's expectations for these projects, please contact Staff Chief Eric Huff at (916) 653-0719 or Eric.Huff@fire.ca.gov.

GUIDELINES FOR THE REMOVAL OF FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) HAZARD TREES UNDER THE FOREST PRACTICE RULES

SCOPE OF WORK:

1. The removal of FEMA hazard trees that threaten public assets.
2. The removal of hazard trees that are an imminent threat to the Debris Removal Crew.

PRE-OPERATIONAL MEETING:

Prior to initiating operations in a CAL FIRE Administrative Unit, it is essential that a meeting occurs between the Unit Forester, Licensed Timber Operator, assigned private RPF, Cal Recycle, and CalOES representatives to discuss site specific details pertaining to operations and permitting.

TIMBER HARVEST DOCUMENTS RECOMMENDED:

1. For the removal of FEMA hazard trees that threaten public assets; the Public Agency, Public and Private Utility Right-of-Way Exemption (14 CCR § 1104.1(b) & (c)) is the appropriate document to meet most of the requirements.
2. For the removal of hazard trees that are an imminent threat to the Debris Removal Crew; most circumstances may be covered utilizing the Public Agency, Public and Private Utility Right-of-Way Exemption (14 CCR § 1104.1(b) & (c)).
3. For specific situations that are not covered by the Right-of-Way Exemption, where hazard trees are an imminent threat to the Debris Removal Crew and are located within 300 feet of an approved and legally permitted structure that was damaged or destroyed by wildfire; the Post-Fire Recovery Exemption (14 CCR § 1038(g)) may be utilized.
4. For specific situations where in-lieu or alternative practices are needed, a Notice of Emergency Timber Operations (14 CCR § 1052) is recommended.

REQUIREMENTS:

1. The Public Agency, Public and Private Utility Right-of-Way Exemption (14 CCR § 1104.1(b) & (c)) allows additional clearance for the removal of Danger Trees that are in areas adjacent to the right-of-way. It is the Department's expectation that professional discretion by Registered Professional Foresters or Arborists is utilized when identifying danger trees in adjacent areas.
2. When in-lieu, exceptions or alternative practices are needed, these operations must be necessary to protect public health and safety. A consultation with the local Unit CAL FIRE Forest Practice Inspector is recommended prior to submitting an Emergency Notice with in-lieu, exception or alternative practices.
3. The Post-Fire Recovery Exemption requires a signature by the Timberland owner. When submitting a Post-Fire Recovery Exemption, attach the Right-of-Entry Permit (ROE) with the landowner's signature to satisfy this requirement. Only Page 1 of the ROE Permit should be attached, as it contains the certification that the signatory is the landowner.
4. For operations under the Public Agency, Public and Private Utility Right-of-Way Exemption (14 CCR § 1104.1(b) & (c)) the use of an ArcGIS Collector application is an acceptable means for displaying information such as watercourse locations, sensitive areas, and parcel data, provided CAL FIRE Forest Practice Inspectors have access to the information for compliance inspection purposes.
5. When filling out the Right-of-Way Exemptions,For the "Contact" and Public Utility, the following contact information should be used when filling out Right-of-Way Exemptions:

   Department of Resources, Recovery, & Recycling (CalRecycle)
   1001 I Street
   Sacramento, California 95814

cc: Deputy Director, Resource Management
Staff Chief, Forest Practice

Attachments: Hazard Tree Removal Options for Cal Recycle
Right-of Entry (ROE) Permit Example

HAZARD TREE REMOVAL OPTIONS FOR CALRECYCLE

	EXEMPTIONS		EMERGENCY
PERMIT OPTIONS	POST-FIRE RECOVERY EXEMPTION (14 CCR § 1038(g))	PUBLIC AGENCY, PUBLIC AND PRIVATE UTILITY RIGHT OF WAY EXEMPTION (14 CCR § 1104.1(b) & (c))	NOTICE OF EMERGENCY TIMBER OPERATIONS (14 CCR § 1052)
RPF REQUIRED?	NO, if within the scope of a Gubernatorial state of emergency or executive order (14 CCR § 1038(g)(2))	NO	YES
AREA/ACREAGE LIMITATIONS	Trees within 300 feet of an Approved and Legally Permitted Structure, damaged, or destroyed. (14 CCR § 1038(g)(1))	NONE	NONE
SILVICULTURE/ STOCKING	NONE	NONE	NONE
DIAMETER LIMIT	Maximum 60" SH for Redwood 48" SH for Other Species (14 CCR § 1038.1(c)(15))	The harvesting of large old trees are limited by 14 CCR § 1104.1(i)(1) & (2)	NONE
SURFACE/LADDER FUELS TREATMENT	All slash within 150 feet of a structure shall be treated or removed and a maximum depth of 18" in the rest of the harvest area; completed within 45 days, except burning (14 CCR § 1038(g)(4)&(5))	None specific to the exemption. Must comply with existing hazard reduction requirements of 14 CCR 917 [937, 957] *et seq.*	None specific to the emergency notice. Must comply with existing hazard reduction requirements of 14 CCR § 917 [937, 957] et seq.
ARCHAEOLOGY REQUIREMENTS	No timber operations in a significant archaeological or historical site; exceptions apply (14 CCR § 1038.1(c)(3))	No timber operations in a significant archaeological or historical site.	For notices greater than 3 acres, RPF shall submit a confidential archaeological letter (14 CCR § 1052(a) (10)) For notices less than 3 acres see 14 CCR § 929.1 [949.1, 969.1] (f)
APPROVAL TIME	5 working days from the Director's receipt of the notice. (14 CCR § 1038.1(c)(13))	5 working days from the Director's receipt of the notice.	5 working days from the Director s receipt of the notice. (14 CCR § 1052(d))
EFFECTIVE PERIOD	1 year (14 CCR § 1038)	1 year	1 year (14 CCR § 1052 (e))
OTHER INFORMATION	Shall include a seven-and-one-half minute USGS quadrangle map, or equivalent depicting the Harvest Area boundaries.	NONE	Shall include a USGS or equivalent map showing the harvest area, legal description, roads, watercourse location and classification, and yarding systems if more than one will be used. 14 CCR $ 1052(a)(4)

ABBREVIATIONS

PRC PUBLIC RESOURCES CODE
CCR CALIFORNIA CODE OF REGULATIONS
FPR FOREST PRACTICE RULES
RPF REGISTERED PROFESSIONAL FORESTER
LTO LICENSED TIMBER OPERATOR
DBH DIAMETER AT BREAST HEIGHT
WLPZ WATERCOURSE LAKE PROTECTION ZONE
ARCH ARCHAEOLOGICAL

**SEE 14 CCR §§ 913.4[933.4, 953.4], 916.9[936.9, 956.9], 1038, 1038.1, 1038.2, AND 1052 FOR ADDITIONAL CONDITIONS AND REQUIREMENTS.

***ALL ACTIVITIES MAY BE SUBJECT TO ADDITIONAL PERMITTING REQUIRMENTS

North Complex Recovery Right-of-Entry (ROE) Permit Checklist for Property Owners

Property Owners must complete an ROE Permit and provide the proper paperwork to enroll in the Government Program. Please follow the checklist below to make sure you have all the necessary documents to submit the ROE Permit. **Applications will not be approved until all required information is received. Please only submit ONE ROE per property.**

Documents needed for submittal of the ROE Permit:

- ☐ ROE Permit for Debris Removal and/or Hazard Tree Removal on Private Property
- ☐ Government Issued ID (Driver's License/Passport)
- ☐ Insurance Policy:
  - ☐ Declaration page
  - ☐ Debris and/or Hazard Tree Removal coverage section/page
  - ☐ Assessor's Parcel Number (APN)
- ☐ Signature of all Property Owners, Trustees or Power of Attorney
- ☐ Trust or LLC Documents (ONLY if applicable)
  - ☐ 1st Page of Trust & Pages naming Trustees
  - ☐ Signature Authorization page
  - ☐ Power of Attorney signature page
  - ☐ Any other relevant pages
- ☐ Signed and notarized document for authorized agent (ONLY if Property Owner is not signing)

All trustees or signatories must sign the ROE Permit for Debris and/or Hazard Tree Removal on Private Property

ROE Permits may be submitted:

IN PERSON:
78 Table Mountain Blvd.
Oroville CA 95965

MAIL:
PO Box 1708
Oroville, CA 95965-1708

E-MAIL:
ROE@ButteCounty.net

FOR MORE INFORMATION CALL:
530.552.3210

Property Owned by 1 or more Individuals

All Owners listed on the title of the home must:

- Sign the ROE Permit for Debris and/or Hazard Tree Removal on Private Property
- Show Government Issued ID (Driver's License/Passport)
- Sign and notarize document for authorized agent (ONLY if Property Owner is not signing)

Property Owned by a Trust, LLC, or other Legal Entity:

If a home is owned by a trust, LLC or other legal entity, please bring:

- First page of the trust, LLC or other agreement
- Signature Authorization page/Pages naming Trustees
- Power of Attorney signature page
- Any other relevant pages

County of Butte
ROE Center
P.O. Box 1708
Oroville, CA 95965-1708
Phone: 530-552-3210
Email: ROE@ButteCounty.net

Name of Owner(s)/Agent: _____

_____

_____

Phone Number of Owner(s)/Agent: _____

Email of Owner(s)/Agent: _____

Property Address: _____

Assessor's Parcel No. (APN): _____

Right-of-Entry Permit for Debris and/or Hazard Tree Removal on Private Property

I / we, _____,
certify that I am / we are the owner(s), or authorized agent of the owner(s), of the real property located at the above address (hereinafter "Owner"). I hereby certify that I have full power and authority to execute this Right of Entry Permit (ROE) without the need for any further action, including, but not limited to, notice to or approval from any other party.

I / we hereby grant Butte County ("County"), as well as the State of California ("State"), and the Federal Government, and their officers, employees, agencies, and independent contractors (collectively, the "Government"), a ROE upon the real property specified above by address and APN (hereafter the "Property") and will guarantee access to the property for the activities described herein.

1. **Time Period:** This ROE shall expire 36 months after the date of the Owner's signature(s), below, or when the Debris and Hazard Tree Removal activities described below are complete, as determined in the sole discretion of the Government, whichever date is sooner.

2. **Purpose:** The Government is granted this ROE to inspect, cut, test, remove, and clear wildfire-generated debris of whatever nature including but not limited to burned or

partially burned structures, ash, concrete foundations, contaminated soil, vehicles, trailers, waste, hazard trees or other debris from the Property ("Debris and Hazard Tree Removal").

3. **Hazard Trees:** Hazard Trees are wildfire-damaged trees that have been so damaged by the fires that their structural integrity is compromised and that pose an immediate threat of falling onto work crews or obstructing their access to the debris clearance site, or falling onto a public right of way or public improved property. The Government has sole discretion on whether to take or leave the hazard trees, to determine whether a tree is hazardous, and to approve tree removal from private roads. Debris and Hazard Tree Removal does not include the removal of tree stumps.

4. **Authorized Activities:** Owner hereby grants to the Government, the right to determine, in the Government's sole discretion, which hazard trees, materials and items on the Property are eligible and will be removed for Debris and Hazard Tree Removal. Owner is responsible for removing, at Owner's expense, any items not eligible for Debris and Hazard Tree Removal. Owner's failure to remove items not eligible for Debris and Hazard Tree Removal may later be deemed a public nuisance by local officials.

5. **Reimbursement:** All Debris and Hazard Tree Removal activities are provided by the Government at no direct cost to Owner. However, the Owner agrees hereby to file an insurance claim if Owner possesses homeowner's, automobile, or property insurance. Most homeowner's insurance policies include coverage for Debris and Hazard Tree Removal. State and federal law require Owner to assign any Debris and Hazard Tree Removal insurance proceeds to the Government to avoid a duplication of benefits (42 USC § 5155; 44 CFR § 204.62). In consideration of the Government's agreement to perform Debris and Hazard Tree Removal, Owner agrees to inform the insurance company listed below of this assignment and agrees to release their insurance information to the Government. This ROE shall constitute Owner's compliance with California Insurance Code section 791.13 authorizing the insurance company to communicate directly with the Government regarding any and all insurance issues related to the Debris and Hazard Tree Removal.

Specified Debris and/or Hazard Tree Removal Insurance Coverage: If Owner's insurance in effect at the time of the wildfire provides specific coverage for Debris and Hazard Tree Removal, then Owner hereby assigns any and all rights, benefits, and proceeds with respect to these particular specific coverages to the County and hereby authorizes that any benefits or proceeds be paid directly and solely to County, in an amount not to exceed the actual cost of the Debris and/or Hazard Tree Removal. Owner shall not be liable for any further Debris and Hazard Tree Removal costs to County.

No Specified Debris and/or Hazard Tree Removal Insurance Coverage: If Owner's insurance in effect at the time of the wildfire does not provide specific and separate coverage for Debris and/or Hazard Tree Removal, but such coverage is included within another larger coverage category, then payment to County shall be limited to the unused benefit amount, after the residence is rebuilt. Owner hereby assigns any and all rights, benefits, and proceeds of any unused benefit amount that is eligible for Debris and/or Hazard Tree Removal remaining in a larger coverage category to County, in an amount not to exceed the actual cost of the Debris and/or Hazard Tree Removal.

Specified Automobile Insurance Coverage: If Owner's automobile insurance in effect at the time of the wildfire provides specific coverage for vehicle removal, then Owner hereby assigns any and all rights, benefits, and proceeds with respect to these particular specific coverages to the County and hereby authorizes that any benefits or proceeds to be paid directly to County, in an amount not to exceed the actual cost of the vehicle removal. Owner shall not be liable for any further vehicle removal costs to County.

No Specified Automobile Insurance Coverage: If Owner's automobile insurance in effect at the time of the wildfire does not provide specific and separate coverage for vehicle removal, but vehicle removal coverage is included within another larger coverage category, then payment to County shall be limited to the unused benefit amount. Owner hereby assigns any and all rights, benefits, and proceeds of any unused benefit amount that is eligible for vehicle removal remaining in a larger coverage category to County, in an amount not to exceed the actual cost of the vehicle removal.

In the event the insurance company or companies listed below issue insurance proceeds for Debris and Hazard Tree Removal or vehicle removal directly to Owner, then Owner shall promptly inform the County of the amount of such proceeds and remit such insurance proceeds to County, not to exceed the actual cost of the applicable Debris and/or Hazard Tree Removal.

Homeowner's Insurance:

Insurance Company: _____

Policy Number: _____

Claim Number: _____

Agent's Name: _____

Agent's Phone / Email: _____

Secondary Insurance, or personal property insurance for other damaged items on the Property:

Insurance Company: _____

Policy Number: _____

Claim Number: _____

Agent's Name: _____

Agent's Phone / Email: _____

Automobile Insurance for car, boat, trailer or other vehicles on the Property:

Insurance Company: _____

Policy Number: _____

Claim Number: _____

Agent's Name: _____

Agent's Phone / Email: _____

If Owner does NOT have homeowner's and/or automobile insurance, or other similar insurance, then Owner certifies under penalty of perjury by his/her signature below that no insurance coverage for the costs associated with fire Debris and/or Hazard Tree Removal at the Property was in effect at the time of the wildfire:

Owner's signature	Date
Owner's signature	Date
Owner's signature	Date

Any property that is sold prior to issuance of the cleanup certification will be withdrawn from the program, unless both new and former Owners sign a property transfer affidavit. Costs for work completed will be billed to the insurance company listed above if applicable.

6. **Waiver of Liability:** Owner acknowledges that the Government's decisions about when, where, and how to provide Debris and Hazard Tree Removal services on Owner's property are discretionary functions. Owner hereby acknowledges that the Government is not liable for any claim based on the exercise or performance, or failure to exercise or perform, a discretionary function, and promises not to make such a claim. **Owner further releases and agrees to hold and save harmless the Government from all liability for any damage or loss whatsoever that may occur during or after performance of the Government's Debris and Hazardous Tree Removal activities. Please also see sections 10 and 11, below**. Owner therefore waives any claims or legal action against the Government. This indemnification is required by state and federal law, including the California Emergency Services Act, California Government Code section 8655, California Code of Regulations, Title 19, section 2925, and the Stafford Act, 42 United States Code, sections 5148 and 5173. Nothing in this section impacts the Owner's right to pursue claims with insurance companies under their applicable insurance policy or policies.

Owner agrees that the methodology for identifying and removing hazard trees, and other debris material, and the selection of personnel to identify hazard trees and other debris material, shall be at the sole discretion of the Government and Owner expressly waives and releases any claims in that regard. Owner expressly waives his or her rights to bring proceedings in law or equity against the Government with respect to the identification and/or removal of hazard trees and other debris material.

7. **Foundations:** In order to participate in this program, Owner must allow removal of all foundations from the subject Property. Stem walls and retaining walls may be left on a case-by-case basis, as approved by the State. Owner acknowledges and understands that the removal of a foundation may leave a depression in the ground, and that it is Owner's responsibility to fill any depression(s) following the removal of a foundation.

8. **Soil Sampling:** Debris removal includes taking soil samples in the debris footprint to ensure that all contaminants have been removed. If initial soil samples do not meet the cleanup goals for this project, then additional soil will be removed from the debris footprint and more soil samples will be taken. Owner acknowledges and hereby authorizes the Government to remove enough soil to ensure cleanup goals have been met. Owner acknowledges this may leave a depression on the Property and that it is Owner's responsibility to fill any depression left on the Property.

9. **Markings of Infrastructure Facilities:** Owner agrees to make their best efforts to mark subgrade utility lines (sewer, water, electricity, gas, cable, etc.), and to mark the location of septic tanks, leach fields, water wells, hand dug wells/cisterns, or other subgrade structures. Owner should carefully complete the attached *Property Information Form* **and append any maps, diagrams, or legible notes** that may be useful to the Government's contractor in locating subgrade structures and instructing the crews which items the Owner may want to remain on the Property following Debris and/or Hazard Tree Removal. The Government will endeavor to avoid all marked structures, however, Owner acknowledges pursuant to Section 6, they indemnify, hold and save harmless the Government from any damages to marked or unmarked structures.

10. **Driveway, Roadway and Other Incidental Damage:** Multi-ton excavators must perform much of the demolition, consolidation and loading of fire debris into trucks for removal to appropriate recycling and disposal and end use sites. The scale and weight of this equipment, and the weight of loaded trucks hauling debris out of fire-damaged neighborhoods, often exceeds the design capacity of residential driveways, sidewalks, and roadways. Crews will take reasonable precautions to mitigate against damage. However, Owner acknowledges cracking and damage to asphalt and concrete pavement is a common and unavoidable consequence, and is therefore considered incidental to Debris and Hazard Tree Removal. By signing this ROE and opting into the Government Debris and Hazard Tree Removal at this Property, the Owner acknowledges the risk of such incidental damage as well as responsibility for the cost of any repairs to private property or jointly-owned private roadways that may be caused by Government contractors in the performance of Debris and Hazard Tree Removal operations. Owner hereby promises to indemnify, hold and save harmless the Government from any repair claims described above, or any other incidental and unavoidable damage occurring as a result of routine operations

associated with such Debris and Hazard Tree Removal.

11. **Damage to Improved Property:** Debris and ash removal crews will attempt to minimize impacts to improved property that was not damaged by the fire. Owner may submit a complaint regarding any improved property that Owner believes was damaged during the Debris and Hazard Tree Removal operations at ROE@ButteCounty.net. However, Owner acknowledges Section 6 of this ROE limits the liability of the Government with respect to such damage, if any.

12. **Erosion Control:** Owner acknowledges that erosion control measures may be necessary, such as wattles and hydromulch, to stabilize soil on or about the Property. Such erosion control measures are at the sole discretion of Government.

13. **Modification:** The provisions of this ROE may not be modified. Owner may cancel this ROE only by submitting an executed *Withdrawal Form* to the County at ROE@ButteCounty.net (see below).

14. **Fraudulent or Willful Misstatement of Fact:** An individual who fraudulently or willfully misstates any fact in connection with this ROE may be subject to penalties under state and federal law, including civil penalties, imprisonment for not more than five years, or both, as provided under 18 United States Code, section 1001.

15. **Public Records Act:** Owner acknowledges that completed ROE forms may be subject to public disclosure under the California Public Records Act (Government Code section 6250 et seq.). Other state and federal laws may apply. While efforts will be made to redact personally identifiable information, such redactions will be made at the sole discretion of Government.

_____

Printed name of Owner or Agent

_____ _____

Signature of Owner or Agent Date

_____

Printed name of Owner or Agent

Signature of Owner or Agent _____ Date _____

Printed name of Owner or Agent _____

Signature of Owner or Agent _____ Date _____

Phone number of Owner or Agent _____ Email address of Owner or Agent _____

Mailing address of Owner or Agent _____

Approved by County of Butte and verified that the Property, APN, and Owner are accurate and meet the eligibility requirements of program:

Title and Printed name of County Representative _____

Signature of County Representative _____ Date _____

Disaster Debris and Hazard Tree Removal Program
Property Information

Please identify all that apply on the Property:

Vehicles	Location	Description	Comments
Car			
Boat or Trailer			
Other vehicles (ATVs, motorcycles, trailers, vans, motorhomes, recreational vehicles, trailers, etc)			
Other (farm equipment, construction equip, etc):			

Underground Tanks	Location	Construction Date (If Known)	Comments
Septic[1] Tanks and Leach Fields			
Fuel/Oil[2]			
Water			
Other:			

1. Septic tanks will be pumped of all waste as part of the Debris and Hazard Tree Removal project only if they posed a hazard to crews.

2. Owner must provide documentation of ownership for large propane tanks to be removed.

Underground Structures	Location	Construction Date (If Known)	Comments
Basement			
Root Cellar			
Other (water wells, cisterns/dug wells, mine shafts, etc):			

Attach, Insert or Draw Map of Property

STOP HERE AND DO NOT FILL OUT THE BELOW PAGE UNLESS YOU WISH TO WITHDRAW FROM THE DEBRIS AND HAZARD TREE REMOVAL PROGRAM

Withdrawal Form

To cancel this ROE, this Withdrawal Form must be signed by the Owner, delivered to the ROE Center at P.O. Box 1708, Oroville, CA, 95965-1708 or ROE@ButteCounty.net, and acknowledged by an authorized employee in advance of Debris and Hazard Tree Removal activities at the Property. Allow at least three (3) days to process.

Alternatively, the ROE may be cancelled at the Property site ***by obtaining the signature of designated Butte County Representative present when the crew appears for work.*** Due to scheduling constraints, the Government cannot provide specific dates and times when they will be available at the Property site to accept a cancellation. Owner should therefore turn in the Withdrawal Form at the location designated by the County in the above paragraph if possible.

I have read and understand the foregoing statement concerning cancellation policies. I hereby certify that the Debris and Hazard Tree Removal at the Property has not yet commenced, and that I request to cancel the Right of Entry (ROE).

_____

Printed name of Owner or Agent

_____ _____

Signature of Owner or Agent Date

_____ _____

Phone number of Owner or Agent Email address of Owner or Agent

_____

Mailing address of Owner or Agent

I hereby acknowledge receipt of the foregoing request for cancellation:

_____

Title and Printed name of County Representative

_____ _____

Signature of County Representative Date

CAL FIRE Regional Unit Forester Contact List

Northern Region

AEU 2700	**Amador-El Dorado Unit** Thomas Tinsley, Forester II 530-647-5203 Thomas.Tinsley@fire.ca.gov	**LMU 2200**	**Lassen-Modoc Unit** Ivan Houser, Forester II 530-257-8503 Ivan.Houser@fire.ca.gov	**SCU 1600**	**Santa Clara Unit** Edgar Orre, Forester II 408-206-3704 Edgar.Orre@fire.ca.gov
BTU 2100	**Butte Unit** David Derby, Forester II 530-872-6334 Dave.Derby@fire.ca.gov	**LNU 1400**	**Sonoma-Lake Napa Unit** Kim Sone, Forester II 707-576-2344 Kim.Sone@fire.ca.gov	**SHU 2400**	**Shasta-Trinity Unit** Ben Rowe, Forester III 530-225-2432 Benjamin.Rowe@fire.ca.gov
CZU 1700	**San Mateo-Santa Cruz Unit** Richard Sampson, Forester II 831-335-6742 Richard.Sampson@fire.ca.gov	**MEU 1100**	**Mendocino Unit** Colby Forrester, Forester III 707-459-7452 Colby.Forrester@fire.ca.gov	**SKU 2600**	**Siskiyou Unit** Steve Wilson, Forester II 530-598-2604 Steve.Wilson@fire.ca.gov
HUU 1200	**Humboldt-Del Norte Unit** Chris Curtis, Forester III 707-726-1256 chris.curtis@fire.ca.gov	**NEU 2300**	**Nevada-Yuba-Placer Unit** David Ahmadi, Forester II 530-265-4589 Ext. 104 David.Ahmadi@fire.ca.gov	**TGU 2500**	**Tehama-Glenn Unit** Dawn Pederson, Forester II 530-528-5199 Dawn.Pederson@fire.ca.gov

Southern Region

BDU 3500	**San Bernardino Unit** David Haas, Forester I 909-881-6955 David.Haas@fire.ca.gov	**MMU 4200**	**Madera-Mariposa-Merced Unit** Brian Mattos, Forester I 209-742-1908 Brian.Mattos@fire.ca.gov	**SLU 3400**	**San Luis Obispo Unit** Alan Peters, Forester II 805-543-4244 Alan.Peters@fire.ca.gov
BEU 4600	**San Benito-Monterey Unit** Jonathan Pangburn, Forester I 831-333-2600 Jonathan.Pangburn@fire.ca.gov	**MVU 3300**	**San Diego Unit** Eric Just, Forester II 619-590-3103 Eric.Just@fire.ca.gov	**TCU 4400**	**Tuolumne-Calaveras Unit** Adam Frese, Forester II 209-754-2706 Adam.Frese@fire.ca.gov
FKU 4300	**Fresno-Kings Unit** Ryan Wimmer, Forester I 559-493-4307 Ryan.Wimmer@fire.ca.gov	**RRU 3100**	**Riverside Unit** Nochella Funes, Forester I 951-659-5257 Nochella.Funes@fire.ca.gov	**TUU 4100**	**Tulare Unit** David Shy, Forester II 559-732-5954 David.Shy@fire.ca.gov

Last updated January 3, 2020.Please send informational updates or changes to Breezy.Akeson@fire.ca.gov.

PROGRAMMATIC AGREEMENT
AMONG
THE FEDERAL EMERGENCY MANAGEMENT AGENCY,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER,
AND
THE CALIFORNIA GOVERNOR'S OFFICE OF EMERGENCY SERVICES

WHEREAS, the mission of the Federal Emergency Management Agency (FEMA) of the U.S. Department of Homeland Security is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards; and

WHEREAS, FEMA makes assistance available to States, Territories, Commonwealths, local governments, Federally recognized Indian Tribes (Tribes), nonprofit organizations, institutions of higher education, individuals, and other eligible entities through programs set forth in Appendix A (Programs), pursuant to the Homeland Security Act of 2002, Pub. L. No. 107-296 (2002) (codified as amended at 6 U.S.C. § 101 *et seq.*); the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Pub. L. No. 93-288 (1974) (codified as amended at 42 U.S.C. § 5121 *et seq.*) (Stafford Act); the Disaster Recovery Reform Act of October 5, 2018 amending the Stafford Act, Pub. L. No. 115-254; the National Flood Insurance Act of 1968, Pub. L. No. 90-448 (1968) (codified as amended at 42 U.S.C. § 4001 et seq.); the Post-Katrina Emergency Management Reform Act of 2006, Pub. L. No. 109-295 (2006) (as amended); implementing regulations contained in Title 44 of the Code of Federal Regulations (CFR), Executive Order 13407, Public Alert and Warning System, (2006), and such other acts, executive orders, implementing regulations as are enacted from time to time; and

WHEREAS, FEMA has determined that implementing its Programs may result in Undertakings [as defined by 54 U.S.C. § 300320 and 36 CFR § 800.16(y)] that may affect properties listed in or eligible for listing in the National Register of Historic Places (National Register) pursuant to 36 CFR Part 60 (historic properties), and FEMA has consulted with the California State Historic Preservation Officer (SHPO) pursuant to Section 106 of the National Historic Preservation Act (NHPA), Pub. L. No. 89-665 (1966) (codified as amended at 54 U.S.C. § 306108), and the regulations implementing Section 106 of the NHPA (Section 106) at 36 CFR Part 800; and

WHEREAS, FEMA, the Advisory Council on Historic Preservation (ACHP), and the National Conference of State Historic Preservation Officers (NCSHPO) have determined that FEMA's Section 106 requirements can be more effectively and efficiently implemented and delays to the delivery of FEMA assistance minimized if a programmatic approach is used to stipulate roles and responsibilities, exempt certain Undertakings from Section 106 review, establish protocols for consultation, facilitate identification and evaluation of historic properties, and streamline the assessment and resolution of adverse effects; and

WHEREAS, FEMA has developed a Prototype Programmatic Agreement (FEMA Prototype Agreement) pursuant to 36 CFR § 800.14(b)(4) in consultation with the ACHP and NCSHPO to serve as a basis for negotiation of a State-specific Programmatic Agreement (Agreement) with the SHPO, State Emergency Management Agency, and/or participating Tribe(s); and

WHEREAS, on October 30, 2014, FEMA, SHPO, and the California Governor's Office of Emergency Services (Cal OES) executed an Agreement that conforms to the FEMA Prototype Agreement with a duration of five (5) years that will expire on October 30, 2019 (2014 Agreement); and

WHEREAS, this Agreement conforms to the FEMA Prototype Agreement as designated by the ACHP on December 17, 2013, and therefore does not require the participation or signature of the ACHP; and

WHEREAS, in order to implement its Programs, FEMA will provide assistance to State of California or Tribes [Recipient(s)] that may provide monies and other assistance to eligible Subrecipients, and as such, FEMA has invited Cal OES, one Recipient responsible for administering funds provided under these Programs to execute this Agreement as an Invited Signatory; and

WHEREAS, FEMA also may directly perform its own Undertakings pursuant to this Agreement; and

WHEREAS, in anticipation or in the immediate aftermath of an event, impacted communities and the State California, and/or affected Tribes, may conduct critical preparedness, response and recovery activities to safeguard public health and safety and/or to restore vital community services and functions before, during, and or following an event. Some of these activities may become Undertakings requiring Section 106 review subject to the terms of this Agreement, and FEMA shall coordinate the appropriate review as warranted; and

WHEREAS, FEMA has determined that its Programs may result in Undertakings with the potential to affect historic properties having religious and cultural significance to Tribes, including sites that may contain human remains and/or associated cultural items; and

WHEREAS, FEMA recognizes that Tribes may have sites of religious and cultural significance on or off Tribal lands [as defined in 36 CFR § 800.16(x)], and in meeting its Federal trust responsibility, FEMA has engaged in government-to-government consultation with all Tribes in California, and all Tribes in neighboring states that have sites of religious and cultural significance within California, and pursuant to 36 CFR § 800.2(c)(2)(ii)(E) has invited participating Tribes to enter into an agreement that specifies how FEMA and Tribes will carry out Section 106 responsibilities, including the confidentiality of information; and

WHEREAS, none of these Tribes indicated an interest in entering into the State-specific 2014 Agreement; and

WHEREAS, February 25, 2016, FEMA and the Middletown Rancheria of Pomo Indians of California (MTR) executed an Agreement that stipulates how FEMA's Section 106 and 110 NHPA requirements will be implemented in the delivery of FEMA assistance on MTR Tribal lands; and

WHEREAS, notwithstanding the aforementioned invitations to enter into a State-specific agreement, FEMA has made a draft of this Agreement available to federally recognized resident tribes and federally recognized nonresident tribes that trace their heritage to California, and has solicited comments and input; and

WHEREAS, certain Tribes have assumed the responsibilities of the SHPO in their Tribal lands through appointment of a Tribal Historic Preservation Officer (THPO) in accordance with Section 101 of the NHPA, and FEMA shall consult with the THPO in lieu of the SHPO for Undertakings occurring on or affecting their Tribal lands; and

WHEREAS, FEMA may invite Tribes that have sites of religious and cultural significance to enter into the terms of this Agreement as invited signatories or concurring parties in accordance with 36 CFR § 800.14(f), and nothing in this Agreement prevents a Tribe from entering into a separate Programmatic Agreement or other agreement with FEMA for administration of FEMA Programs; and

WHEREAS, the terms of this Agreement shall not apply to Undertakings on or affecting Tribal lands without prior execution of the Agreement by the affected Tribe(s); and

WHEREAS, FEMA recognizes that members of the public may have interests in the effects of its Undertakings on historic properties and the Agreement, therefore, in an effort to take into account the views of the public FEMA and Cal OES have made a draft of this Agreement available on their websites and have solicited public comments and input; and

WHEREAS, for the review of specific Undertakings under this Agreement, FEMA may invite other agencies, organizations, and individuals to participate as consulting parties; and

NOW, THEREFORE, FEMA, Cal OES, and the SHPO (Signatories) agree that FEMA Programs in the State of California shall be administered in accordance with the following Stipulations to satisfy FEMA's Section 106 and Section 110(k) responsibilities for all resulting Undertakings, and effectively integrate historic preservation compliance considerations into the delivery of FEMA assistance. FEMA will not authorize implementation of an individual Undertaking until Section 106 review is completed pursuant to this Agreement.

STIPULATIONS

To the extent of its legal authority, and in coordination with other Signatories, FEMA shall ensure that the following measures are implemented:

I. GENERAL

A. Applicability

1. The execution of this Agreement supersedes the terms of the previous Programmatic Agreement in the State of California executed on October 30, 2014.

2. For FEMA Undertakings that also are within the jurisdiction of the Federal Communications Commission (FCC) and within the scope of its Section 106 Programmatic Agreements for communication facilities, FEMA defers Section 106 review in accordance with the ACHP Program Comment, as amended on September 24, 2015 (http://www.ach.gov/docs/pc-wireless-communication.pdf). The approval of funding for the FEMA Undertaking shall be conditioned upon the compliance of the Subrecipient with FCC's applicable Section 106 review, including any required consultation with Tribes. FEMA shall notify the SHPO/THPO when it applies the ACHP Program Comment to an Undertaking. FEMA remains responsible for any FEMA Undertakings it determines are outside the jurisdiction of FCC.

3. In the event of a Stafford Act major disaster or emergency declaration (Declaration), State, Tribal and local governments may lack the capability to perform or to contract for emergency work, and instead request that the work be accomplished by a Federal agency. Through a mission assignment (MA), FEMA may direct appropriate Federal agencies to perform the work. This Agreement shall apply to such Federal assistance undertaken by or funded by FEMA pursuant to Titles IV and V of the Stafford Act and 44 CFR Part 206.

4. FEMA may utilize this Agreement to fulfill its Section 106 responsibilities and those of other Federal agencies that designate FEMA as the lead Federal agency pursuant to 36 CFR § 800.2(a)(2) with appropriate notification to the other Signatories and the ACHP regarding Undertakings that fall within the scope of this Agreement. When FEMA is not designated as the lead Federal agency, all Federal agencies, including FEMA, remain individually responsible for their compliance with Section 106. This provision does not prevent FEMA from recognizing another Federal agency as lead Federal agency for specific Undertakings as appropriate. This provision is in furtherance of the Memorandum Of Understanding (MOU) executed in September of 2019, in accordance with the Unified Federal Review (UFR) requirements pursuant to the Sandy Recovery Improvement Act of 2013 (SRIA) aimed at streamlining the environmental and historic preservation compliance review process related to disaster recovery operations.

5. If another Federal program or Federal agency has concluded Section 106 consultation review and approved an Undertaking within the past two (2) years, FEMA has no further requirement for Section 106 review regarding that Undertaking provided that FEMA:

a. confirms that the scope and effect [as defined by 36 CFR § 800.16(i)] of its Undertaking are the same as that of the Undertaking reviewed by the previous agency, and;

b. determines that the previous agency complied with Section 106 appropriately, and; adopts the findings and determinations of the previous agency.

FEMA shall document these findings in its project file in order to confirm that the requirements of Section 106 have been satisfied. Should FEMA, in consultation with SHPO and participating Tribe(s), determine that the previous Section 106 review was insufficient or involved interagency disagreements about eligibility, effect, and/or treatment measures, FEMA shall conduct additional Section 106 consultation in accordance with the terms of this Agreement.

6. With the written concurrence of the Signatories, other Federal agencies providing financial assistance for the same type of activities covered under the terms of this Agreement as outlined in Appendix A may satisfy their Section 106 responsibilities for such activities by accepting and complying in writing with the terms of this Agreement.

   a. Other Federal Agencies may include States and units of local government who have assumed environmental responsibilities of the U.S. Department of Housing and Urban Development and, acting as the Responsible Entity pursuant to 24 CFR Part 58, are responsible for environmental review, decision-making and action.

   b. In such situations, the other Federal Agency shall notify the Signatories in writing of its intent to use this Agreement to achieve compliance with its Section 106 requirements, and consult with the Signatories regarding its Section 106 compliance responsibilities. Resumes of staff who meet the Secretary of the Interior's Professional Qualification Standard(s) and will review Second Tier projects in accordance with Appendix B of this Agreement shall be provided to FEMA and the SHPO/THPO.

7. FEMA has determined that the following types of activities have limited or no potential to affect historic properties and FEMA has no further Section 106 responsibilities with regards to them, pursuant to 36 CFR § 800.3(a)(1):

   a. Pursuant to 44 CFR § 206.110(m), assistance to individuals and households provided under 44 CFR Part 206, Subpart D and Section 408 of the Stafford Act, including funding for owner-occupied home repair, content replacement, personal property, transportation and healthcare expenses, is exempt from the provisions of Section 106. For ground disturbing activities, and construction related to 44 CFR §§ 206.117(b)(1)(ii) (temporary housing), 206.117(b)(3) (replacement housing), 206.117(b)(4) (permanent housing construction), 206.117(c)(1)(vi) (repair or replacement of privately-owned access routes), and repair of multi-family housing units, FEMA shall conduct Section 106 review.

b. Administrative actions such as personnel actions, travel, procurement of services, supplies (including vehicles and equipment) for the support of day-to-day and emergency operational activities, and the temporary storage of goods provided storage occurs within existing facilities or on previously disturbed soils.

c. Granting of variances, and actions to enforce Federal, Tribal, State, or local codes, standards or regulations.

d. Monitoring, data gathering, and reporting in support of emergency and disaster planning, response and recovery, and hazard activities.

e. Research and development of hazard warning systems, hazard mitigation plans, codes and standards, and education/public awareness programs.

f. Assistance provided for planning, studies, design and engineering costs that involve no commitment of resources other than staffing and associated funding.

g. Assistance provided for training, management and administration, exercises, and mobile/portable equipment purchases; with the exception of potential ground-disturbing activities and modification of existing structures.

h. Community Disaster Loans for funding to perform governmental functions for any eligible jurisdiction in a designated disaster area that has suffered a substantial loss of tax and other revenue pursuant to Section 417 of the Stafford Act.

i. Funding the administrative action of acquisition or lease of existing facilities where planned uses conform to past use or local land use requirements.

j. Funding the administrative action of acquiring properties in acquisition projects, including the real estate transaction.

k. Labor, equipment and materials used to provide security in the Declaration area, including lease, rental, purchase or repair of equipment or vehicles and payment for staff and contract labor.

l. Application of pesticides to reduce adverse public health effects, including aerial and truck-mounted spraying.

m. Unemployment assistance pursuant to Section 410 of the Stafford Act.

n. Distribution of food coupons pursuant to Section 412 of the Stafford Act.

o. Legal services pursuant to Section 415 of the Stafford Act.

p. Crisis counseling pursuant to Section 416 of the Stafford Act.

8. Any FEMA Programs authorized by the United States Congress in the future may be included in this Agreement in accordance with Stipulation IV.A., Amendments. Any change in the FEMA name, Programs, or organizational structure shall not affect this Agreement.

B. Roles and Responsibilities of the Signatories

1. FEMA:

a. FEMA shall use Federal, Tribal, State, Subrecipient, or contractor staff whose qualifications meet the Secretary of the Interior's (Secretary's) Professional Qualifications Standards (Professional Qualifications) set forth in the Federal Register at 48 Fed. Reg. 44716-01 (September 29, 1983), as amended (Qualified), in applying Second Tier II Programmatic Allowances listed in Appendix B, completing identification and evaluation of historic properties and in making determinations of effects. FEMA shall review any National Register eligibility determination and make its own findings of effect resulting from the performance of these activities prior to submitting such determinations to the SHPO and participating Tribe(s).

i. FEMA acknowledges that Tribes possess special expertise in assessing the National Register eligibility of properties with religious and cultural significance to them. Tribal leaders, and as appropriate, their representatives, shall decide who meets qualifications/standards as defined by their Tribes for review of Undertakings affecting properties with religious and cultural significance to them.

b. In accordance with 36 CFR § 800.2(c)(4), FEMA may authorize the Recipient(s), or a Subrecipient through the Recipient(s), to initiate the Section 106 process with the SHPO and other consulting parties, assist in identifying other consulting parties with a demonstrated interest in the Undertaking, and prepare any necessary analyses and documentation, but FEMA shall remain responsible for determinations of National Register eligibility and findings of effect recommended by the authorized party. FEMA shall follow the process set forth in Stipulation I.B.1.a., FEMA Roles and Responsibilities, and notify the SHPO in writing when a Recipient or Subrecipient has been authorized to initiate consultation on FEMA's behalf. FEMA alone shall conduct all Section 106 consultation with Tribe(s).

c. Prior to authorizing the release of funds for individual Undertakings requiring grant conditions pursuant to this Agreement, FEMA shall inform the Recipient(s) of all stipulations and conditions and ensure that they are understood so they can be adequately conveyed to the Subrecipient. FEMA shall work in partnership with the Recipient(s) to provide Subrecipients with guidance on in-kind repair pursuant to *The Secretary of the Interior's Standards for the Treatment of Historic Properties 2017 (Secretary's Standards)*, 36 CFR Part 68, or the most updated version, and techniques to avoid or minimize adverse effects to historic properties.

d. FEMA shall provide the other Signatories and the ACHP with an annual report for the previous calendar year by March 1 of each year that this Agreement is in effect. This annual report will summarize the actions taken to implement the terms of this Agreement, statistics on Undertakings reviewed, and recommend any actions or revisions to be considered, including updates to the appendices.

e. FEMA shall confer annually and as necessary with the other Signatories within sixty (60) days after issuance of the annual report, to review the report and/or discuss issues and concerns in greater detail. This review shall occur in person or by telephone as determined by FEMA.

f. FEMA shall notify the SHPO and affected Tribe(s), as soon as practicable, following a Declaration to provide specific points of contact and other pertinent information about the Declaration.

g. FEMA may convene an initial scoping meeting with the Signatories and other interested parties as soon as practicable after each Declaration to address Declaration-specific issues and procedures.

h. FEMA shall ensure that all documentation resulting from Undertakings reviewed pursuant to this Agreement is consistent with applicable SHPO and Tribal guidelines and the confidentiality provisions of 54 U.S.C. § 307103 and 36 CFR § 800.11(c).

2. SHPO:

a. The SHPO shall review FEMA's determination of the Areas of Potential Effects (APE), National Register eligibility determinations, and FEMA's effect findings, and respond within timeframes required by this Agreement.

b. The SHPO maintains and administers the California Historical Resources Information System (CHRIS), which is an inventory of known historical resources in the State of California. This inventory is archived and made available through regional Information Centers (IC's) located throughout the state.

i. Upon request, the appropriate IC(s) shall provide FEMA with all requested information, unless otherwise precluded by confidentiality restrictions, such as tribal objections. In the case of an Emergency Undertaking (Stipulation II.B.), the information shall be provided on an expedited basis at no charge. For all other Undertakings, the information shall be provided to FEMA or Cal OES (on behalf of FEMA) in accordance with normal CHRIS operating procedures. In both cases, access to and use and sharing of CHRIS inventory information shall be governed by FEMA's active CHRIS Access and Use Agreement. Alternatively, FEMA or Cal OES may enter into access agreements with specific ICs that specify terms of inventory information provision.

ii. If, as a result of a disaster, an IC(s) is closed or rendered inoperable, FEMA or Cal OES may request records for the affected area(s) directly from the SHPO. The SHPO will make every effort to provide all available information on a timely basis, although note that SHPO information may not include all information held by the IC.

c. The SHPO shall identify staff or consultants to assist FEMA staff with their Section 106 responsibilities, and identify, in coordination with FEMA, those activities within the Section 106 review process that the SHPO may perform for specific Undertakings as agreed in writing with FEMA.

d. As requested, SHPO staff shall be reasonably available as a resource and for consultation through site visits, written requests, telephone conversations or electronic media. In those instances where consultation with the SHPO has occurred, FEMA shall provide a written summary via e-mail or regular mail to the SHPO, including any decisions that were reached.

e. The SHPO may delegate some or all of its responsibilities under this Agreement to one or more Liaisons to serve as a dedicated point of contact for consultation with FEMA. The SHPO shall confer with FEMA about the selection of any Liaisons, the scope of responsibilities delegated and related implementing procedures. The SHPO shall formally document these decisions for concurrence by FEMA. Liaisons are not required to be members of the SHPO staff.

f. The SHPO shall participate in an initial scoping meeting for a Declaration.

g. The SHPO may assist local jurisdictions and/or the Recipient(s) in the State of California with advance planning efforts to consider historic properties in the context of homeland security considerations, including disaster preparedness, response, recovery, and mitigation programs for which FEMA funding may be requested.

h. The SHPO shall coordinate with FEMA, to identify consulting parties, including any communities, organizations, or individuals that may have an interest in a specific Undertaking and its effects on historic properties.

i. The SHPO shall participate in annual reviews convened by FEMA to review the effectiveness of this Agreement in accordance with Stipulation I.B.1.e.

3. Recipient(s):

a. The Recipient(s) shall ensure that their Subrecipients understand and acknowledge conditions and potential requirements that may be placed upon Undertakings as a result of Section 106 consultation and the provisions of this Agreement.

b. The Recipient(s) shall participate in an initial scoping meeting for a Declaration.

c. The Recipient(s) shall ensure that their Subrecipients understand that failure to comply with any project-specific conditions that have been placed on their grants could jeopardize FEMA funding.

d. The Recipient(s) shall notify FEMA as soon as possible of any proposed change to the approved scope of work. The Recipient(s) shall direct their Subrecipients not to implement the changes to the proposed scope of work until any additional review required by this Agreement is complete.

e. The Recipient(s) shall ensure that its Subrecipients are made aware that in the event of an unexpected discovery involving an Undertaking that has affected a previously unidentified historic property or human remains, or affected a known historic property in an unanticipated manner, the Subrecipient will comply with Stipulation III.B., Unexpected Discoveries, Previously Unidentified Properties, or Unexpected Effects.

f. The Recipient(s) shall ensure that in its subgrant agreements, any scope of work involving ground disturbance, and resultant contracts to execute said work, provide for the protection of and notification protocols for unexpected discoveries or unexpected effects to historic properties and human remains.

g. If an Invited Signatory Tribe assumes the role of Recipient for projects on Tribal lands, the Tribe shall assume the same responsibilities as outlined in Stipulation I.B.3. of this Agreement, Roles and Responsibilities of the Signatories.

C. Tribal Consultation

1. For FEMA Undertakings on Tribal lands or affecting properties of religious and cultural significance, and where no tribe-specific consultation agreements or protocols are in place, FEMA shall consult with affected Tribe(s) in accordance with 36 CFR Part 800. In determining who the affected Tribe(s) may be, FEMA will first establish that it is a type of Undertaking with potential to affect historic properties with religious and cultural significance and may consult with the SHPO, Tribe(s), Native American Heritage Commission (NAHC), and access applicable tools to identify geographic tribal interests.

2. To the extent permitted by Section 304 of the NHPA, Section 9(a) of the Archeological Resources Protection Act (ARPA) (16 U.S.C. § 470aa – 470mm), and any other applicable laws, FEMA shall ensure it withholds information protected by such laws from public disclosure.

3. FEMA shall invite affected Tribe(s) to participate in the initial scoping meeting within their geographic area of interest for each Declaration.

D. Public Participation

1. FEMA recognizes that the views of the public are essential to informed decision making throughout the Section 106 consultation process. FEMA shall notify the public of proposed Undertakings in a manner that reflects the nature, complexity, significance of historic properties likely affected by the Undertaking, the likely public interest given FEMA's specific involvement, and any confidentiality concerns of Tribe(s), private individuals and businesses.

2. FEMA may consult with the Recipient(s), Subrecipient, SHPO, participating Tribe(s), and other consulting parties to determine if there are individuals or organizations with a demonstrated interest in historic properties that should be included as a consulting party for the Undertaking in accordance with 36 CFR § 800.2(c)(5). If such parties are identified or identify themselves to FEMA, FEMA shall provide them with information regarding the Undertaking and its effects on historic properties, consistent with the confidentiality provisions of 36 CFR § 800.11(c).

3. In accordance with the outreach strategy developed for an Undertaking in consultation with the SHPO and participating Tribe(s), for involving the public, FEMA shall identify the appropriate stages for seeking public input during the Section 106 consultation process. FEMA shall consider all views provided by the public regarding an Undertaking.

4. FEMA may also provide public notices and the opportunity for public comment or participation in an Undertaking through the public participation process of the National Environmental Policy Act (NEPA) and FEMA's implementing policies set forth in DHS Directive No. 023-01, *Implementation of the National Environmental Policy Act* (Oct. 31, 2014); DHS Instruction No. 023-01-001-01, *Implementation of the National Environmental Policy Act* (Nov. 6, 2014); FEMA Directive No. 108-1, *Environmental Planning and Historic Preservation Responsibilities and Program Requirements* (Aug. 22, 2016); FEMA Instruction No. 108-1-1, *Instruction on Implementation of the Environmental Planning and Historic Preservation Responsibilities and Program Requirements* (Aug. 22, 2016); and/or Executive Orders 11988 Floodplain Management and 11990 Protection of Wetlands relating to floodplains and wetlands as set out in 44 CFR Part 9, and Executive Order 12898, Environmental Justice, provided such notices specifically reference Section 106 as a basis for public involvement.

5. Should a member of the public object in writing to implementation of the Agreement's terms, FEMA will notify the other Signatories in writing and take the objection into consideration. FEMA shall consult with the objecting party and, if that party so requests, the other Signatories, for not more than thirty (30) days. In reaching its decision regarding the objection, FEMA shall take into consideration all comments from these parties. Within fifteen (15) days after closure of this consultation period, FEMA shall provide the other parties with its final decision in writing.

E. Timeframes and Communications

1. All time designations shall be in calendar days unless otherwise stipulated. If any Signatory does not object to FEMA's finding or determination related to an Undertaking within an agreed-upon timeframe, FEMA may proceed to the next step in the consultation process as described in Stipulation II., Project Review.

2. Due to the varied nature of Undertakings, the individual response times to FEMA's requests for comment/concurrence will vary. These response times are contingent upon FEMA ensuring that its findings and determinations are made by Qualified staff and supported by documentation as required by 36 CFR § 800.11(d) and 36 CFR § 800.11(e), and consistent with FEMA guidance.

   a. For Emergency Undertakings as outlined in Stipulation II.B., Expedited Review of Emergency Undertakings, the SHPO shall respond to any FEMA request for comments within three (3) days after receipt, unless FEMA determines the nature of the emergency action warrants a shorter time period.

   b. For Undertakings associated with the Individual Assistance (IA) program the response time for each request for concurrence shall be fifteen (15) days, and for Undertakings associated with the Public Assistance (PA) program, the response time for each request for concurrence shall be fifteen (15) days for submittals related to an open declared-disaster operation, and thirty (30) days thereafter, or in accordance with temporary timelines established by FEMA on a Declaration-by-Declaration basis.

   c. For the Hazard Mitigation Grant Program (HMGP) and all non-disaster programs, the response time for each request for concurrence shall be a maximum of thirty (30) days.

3. The consulting parties may send and accept official notices, comments, requests for further information and documentation, and other communications required by this Agreement by e-mail. As appropriate, if it will facilitate completion of reviews, hard copies may be requested.

II. PROJECT REVIEW

A. Programmatic Allowances

1. If FEMA determines an Undertaking conforms to one or more of the Programmatic Allowances (Allowances) in Appendix B of this Agreement, FEMA shall complete the Section 106 review process by documenting this determination in the project file, without SHPO review or notification.

2. If the Undertaking involves a National Historic Landmark (NHL), FEMA shall notify the SHPO, participating Tribe(s), the NPS NHL Program Manager of the NPS Pacific

West Regional Office, and Cal OES that the Undertaking conforms to one or more Allowances. FEMA shall provide information about the proposed scope of work for the Undertaking and the Allowance(s) enabling FEMA's determination.

3. If FEMA determines any portion of an Undertaking's scope of work does not conform to one or more Allowances listed in Appendix B, FEMA shall conduct expedited or standard Section 106 review, as appropriate, for the entire Undertaking in accordance with Stipulation II.B., Expedited Review for Emergency Undertakings, or Stipulation II.C., Standard Project Review.

4. Allowances may be revised and new Allowances may be added to this Agreement in accordance with Stipulation IV.A.3., Amendments.

B. Expedited Review for Emergency Undertakings

1. Determine Expedited Review

a. As part of the Declaration process, FEMA shall define the time interval during which the disaster-causing incident occurs [the incident period, as defined in 44 CFR § 206.32(f)]. FEMA may approve direct Federal assistance and/or funding for emergency work [as defined in 44 CFR § 206.201(b)] that occurs during the incident period, including work already completed, in response to an immediate threat to human health and safety or property. Pursuant to 36 CFR § 800.12(d), FEMA may conduct expedited review of emergency Undertakings for thirty (30) days from the date that a disaster or emergency has been formally declared by the President.

b. Should FEMA determine that it is necessary to extend the expedited review period for emergency Undertakings beyond the initial thirty (30) days, FEMA shall, in 30-day increments, as needed, notify in writing the ACHP, SHPO, Cal OES, and participating Tribe(s).

2. Conduct Expedited Reviews

a. If the emergency Undertaking is an immediate rescue and salvage operation conducted in response to an event to preserve life and property, FEMA has no Section 106 consultation responsibilities in accordance with 36 CFR § 800.12(d); or

b. If the emergency Undertaking meets one or more of the Allowances in Appendix B of this Agreement, FEMA shall complete the Section 106 review process pursuant to Stipulation II.A.1., Programmatic Allowances.

c. If FEMA determines that the emergency Undertaking would adversely affect a historic property during this expedited review period:

i. To the extent practicable, FEMA will propose treatment measures (avoidance, minimization, and mitigation) that would resolve adverse effects during implementation, and request the comments of the SHPO, Cal OES, Subrecipient, and participating Tribe(s) within three (3) days of receipt of this information unless FEMA determines the nature of the emergency warrants a shorter time period.

ii. FEMA may provide this information through written requests, telephone conversations, meetings, or electronic media. In all cases, FEMA shall clarify that an "expedited review" is being requested for the Undertaking.

iii. FEMA shall take into account any timely comments provided by the SHPO, Subrecipient, and/or participating Tribe(s) in making a decision on how to proceed.

iv. Should the SHPO, Subrecipient, and/or participating Tribe(s) not comment within three (3) days, FEMA shall complete Section 106 consultation for the Undertaking based on the available information.

v. FEMA shall notify the SHPO, Subrecipient, and participating Tribe(s) of the final decision, indicating how any comments received were considered in reaching that decision.

C. Standard Project Review: For Undertakings not exempt from further Section 106 review, FEMA shall ensure that the following standard project review steps are implemented. In the interest of streamlining, FEMA may combine some or all of these steps during consultation in accordance with 36 CFR § 800.3(g).

1. Consulting Parties: FEMA shall consider all written requests of individuals and organizations to participate as consulting parties, and consult with the SHPO and participating Tribe(s) to identify any other parties that meet the criteria to be consulting parties and invite them to participate in the Section 106 process. FEMA may invite others to participate as consulting parties as the Section 106 consultation proceeds. FEMA shall invite any individual or organization that will assume a specific role or responsibility outlined in a Memorandum of Agreement or Programmatic Agreement to participate as an invited signatory to the Agreement.

2. Area of Potential Effects:

a. For standing structures not adjacent to or located within the boundaries of a National Register listed or eligible district, Qualified staff may define the APE, as defined at 36 CFR § 800.16(d), as the individual structure when the proposed Undertaking is limited to its repair or rehabilitation [as defined in 36 CFR § 68.2(b)].

b. For all other Undertakings, Qualified staff shall determine the APE in consultation with the SHPO and participating Tribe(s). FEMA may consider information provided by other parties, such as local governments and the public, when establishing the APE.

3. Identification and Evaluation: Qualified staff shall determine, in consultation with the SHPO and participating Tribe(s) if the APE contains historic properties, including properties of religious and cultural significance. This may include the review of documentation provided by the Recipient(s) or Subrecipient in coordination with the SHPO.

   a. Level of Effort: FEMA shall make a reasonable and good faith effort to identify historic properties in accordance with 36 CFR § 800.4(b)(1). FEMA may consult with the SHPO to determine the level of effort and methodology necessary to identify and evaluate a variety of historic property types. For properties of religious and cultural significance to affected Tribe(s), FEMA shall consult with the affected Tribe(s) to determine geographical areas containing them that may be affected by an Undertaking and determine the necessary level of effort to identify and evaluate or avoid any such historic properties.

   b. National Historic Landmarks: When FEMA identifies an Undertaking with the potential to affect an NHL, FEMA shall contact the NPS NHL Program Manager of the Pacific West Regional Office (Pacific West Region, 333 Bush Street, Suite 500, San Francisco, CA 94104-2828) in addition to the SHPO, participating Tribe(s), and other consulting parties. The purpose of this notification is to ensure early coordination for the Undertaking, which FEMA later may determine adversely affects the NHL as outlined in Stipulation II.C.6.

   c. Determinations of Eligibility: FEMA shall review or determine National Register eligibility based on identification and evaluation efforts, and consult with the SHPO, participating Tribe(s), and other consulting parties regarding these determinations. Should the SHPO, participating Tribe(s), or another consulting party disagree with the determination of eligibility, FEMA shall either:

      i. Elect to consult further with the objecting party until the objection is resolved;

      ii. Treat the property as eligible for the National Register; or

      iii. Obtain a determination of eligibility from the Keeper of the National Register (Keeper) in accordance with 36 CFR § 63.2(d)-(e) and 36 CFR § 800.4(c)(2).

4. Findings of No Historic Properties Affected: FEMA shall make a finding of "no historic properties affected" under the following circumstances:

   a. If no historic properties are present in the APE;

b. The Undertaking is designed to avoid effects to historic properties, including National Register listed or eligible properties of religious and cultural significance to participating Tribe(s); or

c. The Undertaking does not affect the character-defining features of a historic property.

d. FEMA shall notify the SHPO, participating Tribes(s), and any other consulting parties of this finding and provide supporting documentation in accordance with 36 CFR § 800.11(d). Unless the SHPO or participating Tribe(s) objects to the finding within the applicable timeframe outlined in Stipulation I.E., Timeframes and Communications, the Section 106 review of the Undertaking will have concluded.

e. If the SHPO or participating Tribe(s) objects to a finding of "no historic properties affected," FEMA shall consult with the objecting party to resolve the disagreement.

   i. If the objection is resolved, FEMA either may proceed with the Undertaking in accordance with the resolution or reconsider effects on the historic property by applying the criteria of adverse effect pursuant to Stipulation II.C.5., Application of the Criteria of Adverse Effect, below.

   ii. If FEMA is unable to resolve the disagreement, it will forward the finding and supporting documentation to the ACHP and request that the ACHP review FEMA's finding in accordance with 36 CFR § 800.4(d)(1)(iv)(A) through 36 CFR § 800.4(d)(1)(iv)(C). FEMA shall consider the ACHP's recommendation in making its final determination. If FEMA's final determination is to reaffirm its "no historic properties affected" finding, the Section 106 review of the Undertaking will have concluded. Otherwise, FEMA will proceed to Stipulation II.C.5., below.

5. Application of the Criteria of Adverse Effect: If FEMA finds an Undertaking may affect historic properties in the APE, including those of religious and cultural significance to affected Tribe(s), FEMA shall apply the criteria of adverse effect to historic properties within the APE(s), taking into account the views of the consulting parties and the public concerning effects in accordance with 36 CFR § 800.5(a).

   a. If FEMA determines that an Undertaking does not meet the adverse effect criteria, FEMA shall propose a finding of "no adverse effect" in accordance with 36 CFR § 800.5(b).

      i. FEMA shall notify the SHPO, participating Tribe(s), and all other consulting parties of its finding and provide supporting documentation pursuant to 36 CFR §800.11(e).

ii. Unless a consulting party objects within the applicable timeframe outlined in Stipulation I.E., Timeframes and Communications, FEMA will proceed with its "no adverse effect" determination and conclude the Section 106 review.

iii. If a consulting party objects to a finding of "no adverse effect," FEMA will consult with the objecting party to resolve the disagreement.

1) If the objection is resolved, FEMA shall proceed with the Undertaking in accordance with the resolution, or;

2) If the objection cannot he resolved, FEMA shall request that the ACHP review the findings in accordance with 36 CFR § 800.5(c)(3)(i)-(ii), and submit the required supporting documentation. FEMA shall consider the ACHP's comments in making its final determination.

b. If FEMA finds the Undertaking may adversely affect historic properties, FEMA shall request through the Recipient(s) that the Subrecipient revise the scope of work to substantially conform to the *Secretary's Standards* for standing structures, or avoid or minimize adverse effects for National Register listed or eligible archaeological properties.

i. If the Subrecipient modifies the scope of work to avoid the adverse effect, FEMA shall notify the SHPO, participating Tribe(s), and all other consulting parties, and provide supporting documentation, including the necessary conditions. Unless a consulting party makes a timely objection in accordance with the applicable timeframe outlined in Stipulation I.E., Timeframes and Communications, FEMA shall proceed with its "no adverse effect" determination, including any conditions, and conclude the Section 106 review.

ii. If an Undertaking is not modified to avoid the adverse effect(s), FEMA shall initiate consultation to resolve the adverse effect(s) in accordance with Stipulation II.C.6., Resolution of Adverse Effects.

6. Resolution of Adverse Effects: If FEMA determines that an Undertaking may adversely affect a historic property, it shall resolve the effects of the Undertaking in consultation with the SHPO, Recipient(s), Subrecipient, participating Tribe(s), the ACHP, if participating, and other consulting parties, by one of the following methods depending upon the severity of the adverse effect(s) as well as the determination of the historic property's significance on a local, state or national level. When FEMA determines an Undertaking will adversely affect an NHL, FEMA shall notify and invite the Secretary and the ACHP to participate in consultation in accordance with 36 CFR § 800.10. When the ACHP participates in consultation related to an NHL, the ACHP shall report the outcome of the consultation to the Secretary and the FEMA Administrator.

a. Abbreviated Consultation Process: FEMA will propose in writing to the consulting parties to resolve the adverse effects of the Undertaking through the application of one or more Treatment Measures outlined in Appendix C as negotiated with the SHPO, participating Tribes, and other consulting parties. The use of these Treatment Measures shall not require the execution of a Memorandum of Agreement (MOA) or Programmatic Agreement.

   i. In consultation with the SHPO, participating Tribe(s), and other consulting parties, FEMA shall propose in writing the implementation of a specific Treatment Measure, or combination of Treatment Measures, with the intent of expediting the resolution of adverse effects, and provide documentation as required by 36 CFR § 800.11(e), subject to the confidentiality provisions of 36 CFR § 800.11(c). Unless a consulting party or the ACHP objects within thirty (30) days of receipt of FEMA's proposal, FEMA shall proceed with the implementation of the Treatment Measure(s) and will conclude the Section 106 review.

   ii. If any of the consulting parties or the ACHP objects within the thirty (30) review-and-comment period to the resolution of adverse effects through the application of the Abbreviated Consultation Process, FEMA shall resolve the adverse effect(s) using procedures outlined below in Stipulation II.C.6.b., MOA, or Stipulation II.C.6.c., Programmatic Agreement.

   iii. Because funding and implementation details of Treatment Measures for specific Undertakings may vary by program, FEMA shall provide written notice to the consulting parties within sixty (60) days of the completion of the Treatment Measure(s). This written notice will serve as confirmation that the Treatment Measure(s) for a specific Undertaking have been implemented. FEMA also shall include information pertaining to the completion of Treatment Measures in the annual report pursuant to Stipulation I.B.1.d., FEMA Roles and Responsibilities.

b. Memorandum of Agreement: FEMA shall provide the ACHP with an adverse effect notice in accordance with 36 CFR § 800.6(a)(1) if it has not already provided such under the Abbreviated Consultation Process of this Agreement, if a consulting party or the ACHP objects in accordance with Stipulation II.C.6.a.ii., or if FEMA in consultation with the SHPO, participating Tribe(s), and other consulting parties has determined that an MOA would be more appropriate to resolve the adverse effect(s). In consultation with the SHPO, participating Tribe(s), and other consulting parties, including the ACHP (if participating), FEMA shall develop an MOA in accordance with 36 CFR § 800.6(c) to agree upon treatment measures to avoid, minimize, and/or mitigate adverse effects on historic properties. The MOA may also include treatment measures that serve an equal or greater public benefit in promoting the preservation of historic properties in lieu of more traditional treatment measures.

c. Programmatic Agreement: Should the execution of an MOA be inappropriate given the similar nature of effects on historic properties, the inability to determine effects prior to approval of an Undertaking, or where other circumstances warrant, FEMA shall consult with the SHPO, participating Tribe(s), the ACHP, if participating, and any other consulting parties to develop a Programmatic Agreement in accordance with 36 CFR § 800.14(b), and identify programmatic conditions or treatment measures to govern the resolution of potential or anticipated adverse effects from certain complex project situations for an Undertaking or for multiple but similar Undertakings by a single Subrecipient.

7. Objections: Should any Signatory or consulting party object within the timeframes established by this Agreement to any plans, specifications, or actions taken pursuant to resolving an adverse effect, FEMA shall consult further with the objecting party to seek resolution. If FEMA determines the objection cannot be resolved, FEMA shall address the objection in accordance with Stipulation IV.B., Dispute Resolution.

III. OTHER CONSIDERATIONS

A. Changes to an Approved Scope of Work: The Recipient(s) shall notify FEMA and shall require a Subrecipient to notify it immediately when a Subrecipient proposes changes to an approved scope of work for an Undertaking.

1. If FEMA determines the change meets a Programmatic Allowance or has no effect on the property, FEMA shall approve the change.

2. If the change can be modified to meet an Allowance, or conform to any applicable *Secretary's Standards*, FEMA shall conclude its Section 106 review responsibilities.

3. If FEMA determines that the change does not meet an Allowance, FEMA shall initiate consultation pursuant to Stipulation II.C., Standard Project Review.

B. Unexpected Discoveries, Previously Unidentified Properties, or Unexpected Effects:

1. Upon notification by a Subrecipient of an unexpected discovery, or if it appears that an Undertaking has affected a previously unidentified property or affected a known historic property in an unanticipated manner, in accordance with Stipulation I.B.3.e., Recipient(s) Roles and Responsibilities, the Recipient(s) shall immediately notify FEMA and require the Subrecipient to:

a. Stop construction activities in the vicinity of the discovery.

b. Take all reasonable measures to avoid or minimize harm to the property until FEMA has completed consultation with the SHPO, participating Tribe(s), and any other consulting parties. Upon notification by the Recipient of a discovery, FEMA shall immediately notify the SHPO, participating Tribe(s), and other consulting parties that may have an interest in the discovery, previously unidentified property

or unexpected effects, and consult to evaluate the discovery for National Register eligibility and/or the effects of the Undertaking on historic properties.

c. If human remains are discovered, ensure that there shall be no further excavation or disturbance of any nearby area that may also contain human remains, and notify the county coroner/medical examiner immediately in accordance with Section 7050.5 of the California Health and Safety Code. Discoveries of human remains on Federal or Tribal lands shall be subject to the Native American Graves Protection and Repatriation Act (NAGPRA) (25 U.S.C. § 3001-3013, 18 U.S.C. § 1170) and the Archeological Resources Protection Act (ARPA) (16 U.S.C. 470aa-470mm; Public Law 96-95 as amended), and state codes, as applicable.

d. Assist FEMA in completing the following actions, as required:

i. FEMA shall consult with the SHPO, participating Tribe(s), and other consulting parties in accordance with the consultation process outlined in Stipulation II., Project Review, to develop a mutually-agreeable action plan with timeframes to identify the discovery or previously unidentified property, take into account the effects of the Undertaking, resolve adverse effects if necessary, and ensure compliance with applicable Federal, State, and local statutes.

ii. FEMA shall coordinate with the Recipient(s) and the Subrecipient regarding any needed modification to the scope of work for the Undertaking necessary to implement recommendations of the consultation and facilitate proceeding with the Undertaking.

iii. In cases where discovered human remains are determined to be Native American, FEMA shall consult with the appropriate Tribal representatives and the SHPO. In addition, FEMA shall follow the guidelines outlined in the ACHP's *Policy Statement Regarding the Treatment of Burial Sites, Human Remains, and Funerary Objects (2007)* and any State-specific policies that may be in force.

C. Curation

1. In cases where archaeological survey and testing are conducted on private land, any recovered collections remain the property of the land owner. In such instances, FEMA and the Recipient(s), in coordination with the SHPO and affected Tribe(s), shall encourage land owners to donate the collection(s) to an appropriate public or Tribal entity. In cases where the property owner wishes to transfer ownership of the collection(s) to a public or Tribal entity, and in the case of artifacts recovered from public lands, FEMA and the Recipient(s) shall ensure that recovered artifacts and related documentation are curated in a suitable repository as agreed to by FEMA, the SHPO, and affected Tribe(s), following applicable State or Tribal guidelines.

2. When an Undertaking will adversely affect an archaeological resource listed in or eligible for the National Register, FEMA may treat the adverse effect by providing for

the recovery of significant information through archaeological data recovery. FEMA shall consult with the SHPO, participating Tribe(s), and other consulting parties to prepare a research design (data recovery plan), including a specific plan for curation. This plan will incorporate any relevant curation provisions contained in the *California Guidelines for the Curation of Archeological Collections (May 7, 1993),* ACHP's *Recommended Approach for Consultation on Recovery of Significant Information from Archaeological Sites* published in the Federal Register [64 Federal Register 27085-27087 (May 18, 1999)], or other provisions agreed to by the consulting parties. No excavation should be initiated before FEMA acceptance and approval of the curation plan.

a. As stipulated in the curation plan, artifacts, as well as field and laboratory records sufficient to document the collection, shall be curated at a facility, preferably in-state, that meets the standards of, and in accordance with the provisions of 36 CFR Part 79, *Curation of Federally Owned and Administered Archaeological Collections,* and applicable State or Tribal requirements.

D. Review of Undertakings Initiated Before Initiation or Completion of Section 106 Review

1. In accordance with Section 110(k) of the NHPA, FEMA shall not grant assistance to a Subrecipient who, with intent to avoid the requirements of this Agreement or Section 106 of the NHPA, has intentionally significantly and adversely affected a historic property to which the assistance would relate, or having legal power to prevent it, allowed an adverse effect to occur. However, if after consultation with the SHPO, Recipient, appropriate Tribes(s), and ACHP, FEMA determines that extraordinary circumstances justify granting assistance despite the adverse effect created or permitted by the Subrecipient, FEMA shall complete consultation for the Undertaking pursuant to the terms of this Agreement.

2. FEMA shall specifically advise the Recipient(s) and shall require that the Recipient(s) advise its Subrecipients in writing that they may jeopardize Federal funding if work is performed without all required local, State, and Federal licenses, permits, and/or approvals, including the completion of the Section 106 process. FEMA also shall document this requirement in its Record of Environmental Consideration, as applicable, as well as all project approval documents specifying the project scope and limits, and containing all conditions and caveats.

3. In circumstances where FEMA determines a Subrecipient has initiated an Undertaking without willful intent to avoid the requirements of this Agreement or Section 106 of NHPA, FEMA shall proceed as follows:

a. Determine if the Undertaking is of a type for which FEMA has no further Section 106 responsibilities, namely:

i. An Undertaking listed in Stipulation I.A.7.; or

ii. An immediate rescue and salvage operation in accordance with 36 CFR § 800.12(d); or

iii. A Programmatic Allowance as described under Stipulation II.A.

b. In any such cases listed in Stipulation III.D.3.a., above, FEMA shall document this determination in the project files, and consider the Undertaking Section 106 compliant.

c. If FEMA determines the Undertaking would have required Section 106 review, FEMA shall coordinate with the SHPO and appropriate Tribe(s) to determine if consultation is feasible.

i. If after coordination with the SHPO and appropriate Tribes, FEMA determines that consultation is feasible, FEMA shall review the Undertaking in accordance with Stipulation II.C., Standard Project Review.

ii. If after coordination with the SHPO and appropriate Tribe(s), FEMA determines that review is infeasible, FEMA shall document the outcome of the Section 106 review process, inform the Federal Preservation Officer of the outcome, and the applicable FEMA Program shall take the outcome into account before making a decision whether to fund the Undertaking. FEMA shall provide written notification of its funding decision to the SHPO, the Recipient, appropriate Tribe(s), and the ACHP.

4. FEMA shall ensure that all Undertakings considered for after-the-fact review in accordance with this Stipulation are included in the annual report.

IV. IMPLEMENTATION OF AGREEMENT

A. Amendments

1. If any Signatory determines that an amendment to the terms of this Agreement must be made, FEMA shall notify the Signatories of the proposed amendment in writing and consult for no more than thirty (30) days to seek amendment of the Agreement.

2. An amendment to this Agreement, exclusive of the Appendices, shall be effective only when it has been signed by all the Signatories. An amendment shall be effective for Undertakings occurring on or affecting historic properties on Tribal lands only when the Tribe has signed the Agreement and its amendment.

3. Appendix A (FEMA Programs), Appendix B (Programmatic Allowances), and Appendix C (Treatment Measures) may be amended at the request of FEMA or another Signatory in the following manner:

a. FEMA, on its own behalf or on behalf of another Signatory, shall notify the Signatories of the intent to modify the current Appendix or Appendices and shall provide a draft of the updated Appendix or Appendices to all Signatory parties.

b. If no other Signatory objects in writing within thirty (30) days of receipt of FEMA's proposed modification, FEMA shall date and sign the amended Appendix and provide a copy of the amended Appendix to the other Signatories. Such an amendment shall go into effect on the date FEMA transmits the amendment to the other Signatories.

B. Dispute Resolution

1. Should any Signatory object in writing to the terms of this Agreement, FEMA shall consult with the objecting party for not more than thirty (30) days to resolve the objection.

2. If the objection is resolved within thirty (30) days, FEMA shall proceed in accordance with the resolution.

3. If FEMA determines within thirty (30) days that the objection cannot be resolved, FEMA shall forward to the ACHP all documentation relevant to the objection, including FEMA's proposed resolution. Within thirty (30) days of receipt, the ACHP will:

   a. Concur in FEMA's proposed resolution; or

   b. Provide FEMA with recommendations, which FEMA shall take into account in reaching a final decision regarding the objection; or

   c. Notify FEMA that the objection will be referred for comment in accordance with 36 CFR § 800.7(a)(4), and proceed to do so.

4. FEMA shall take into account any ACHP recommendations or comments, and any comments from the other Signatories, in reaching a final decision regarding the objection. FEMA shall provide in writing to the ACHP and Signatories a summary of its final decision before authorizing any disputed action to proceed. The Signatories shall continue to implement all other terms of this Agreement that are not subject to objection.

5. Should the ACHP not respond within thirty (30) days, FEMA may assume the ACHP has no comment and proceed with its proposed resolution to the objection after providing the ACHP and Signatories a written summary of its final decision.

C. Severability and Termination

1. In the event any provision of this Agreement is deemed by a Federal court to be contrary to, or in violation of, any applicable existing law or regulation of the United States of America, only the conflicting provision(s) shall be deemed null and void, and the remaining provisions of the Agreement shall remain in effect.

2. FEMA, the SHPO, Cal OES, or the ACHP may terminate this Agreement by providing thirty (30) days written notice to the other Signatories, provided that the Signatories consult during this period to seek amendments or other actions that would prevent termination. If this Agreement is terminated, FEMA shall comply with Section 106 through other applicable means pursuant to 36 CFR Part 800. Upon such determination, FEMA shall provide all other Signatories and the ACHP with written notice of the termination of this Agreement.

3. A participating Tribe may notify the other Signatories that it is fully withdrawing from participation in the Agreement. Following such a withdrawal, FEMA shall review Undertakings that may affect historic properties of religious and cultural significance to the Tribe, and Undertakings that occur on the Tribal lands of the relevant Tribe, in accordance with 36 CFR §§ 800.3 through 800.7, 36 CFR § 800.8(c), or an applicable alternative under 36 CFR § 800.14. Withdrawal from this Agreement by a Tribe does not terminate the Agreement. At any time that this Agreement remains in effect, a Tribe that has withdrawn from the Agreement may notify FEMA, the Recipient(s), and the SHPO in writing that it has rescinded its notice withdrawing from participation in the Agreement.

4. This Agreement may be terminated by the implementation of a subsequent Agreement, pursuant to 36 CFR § 800.14(b), that explicitly terminates or supersedes this Agreement, or by FEMA's implementation of Alternate Procedures, pursuant to 36 CFR § 800.14(a).

D. Duration and Extension

1. This Agreement shall remain in effect from the date of execution for a period not to exceed seven (7) years unless otherwise extended pursuant to Stipulation IV.D.2. below, or terminated pursuant to Stipulation IV.C.2. or IV.C.4., Severability and Termination. The Agreement shall remain in effect for Declarations made prior to expiration of the Agreement in order to minimize delays in delivery of FEMA assistance.

2. The Signatories may collectively agree to extend this Agreement to cover additional calendar years, or portions thereof, through an amendment per Stipulation IV.A., provided that the original Agreement has not expired.

E. Execution and Implementation

1. This Agreement may be executed in counterparts, with a separate page for each Signatory, and shall become effective on the date of the final signatures of FEMA and the SHPO.

2. The Agreement shall go into effect regarding Undertakings occurring, or affecting historic properties, on Tribal lands when the relevant Tribe has signed the Agreement.

3. FEMA shall ensure that each Signatory is provided with a complete copy of the Agreement, including an original set of signatures.

4. Execution and implementation of this Agreement evidence that FEMA has afforded the ACHP a reasonable opportunity to comment on FEMA's administration of all referenced Programs, and that FEMA has satisfied its Section 106 responsibilities for all individual Undertakings of its referenced Programs.

PROGRAMMATIC AGREEMENT
AMONG
THE FEDERAL EMERGENCY MANAGEMENT AGENCY,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER,
AND
THE CALIFORNIA GOVERNOR'S OFFICE OF EMERGENCY SERVICES

SIGNATORY PARTIES

FEDERAL EMERGENCY MANAGEMENT AGENCY

By: _____ Date: OCT 24 '19
Robert Fenton, Regional Administrator, Region IX

By: _____ Date: 10/23/19
Alessandro Amaglio, Environmental Officer, Region IX

PROGRAMMATIC AGREEMENT
AMONG
THE FEDERAL EMERGENCY MANAGEMENT AGENCY,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER,
AND
THE CALIFORNIA GOVERNOR'S OFFICE OF EMERGENCY SERVICES

SIGNATORY PARTIES

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

By: _____ Date: 29 Oct 2019

Julianne Polanco, State Historic Preservation Officer

PROGRAMMATIC AGREEMENT
AMONG
THE FEDERAL EMERGENCY MANAGEMENT AGENCY,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER,
AND
THE CALIFORNIA GOVERNOR'S OFFICE OF EMERGENCY SERVICES

SIGNATORY PARTIES

CALIFORNIA GOVERNOR'S OFFICE OF EMERGENCY SERVICES

By: _____ Date: 10-29-19

Mark Ghilarducci, Director

Appendix A

FEMA Program Summaries

This Appendix may be amended in accordance with Stipulation IV.A., Amendments.

Disaster Programs

The following programs are authorized under Titles IV and V of the Stafford Act.

Advance of Nonfederal Share
The Stafford Act and its implementing regulations authorize FEMA to advance or loan to a state, tribal government, local government, or applicant the portion of PA for which the state or tribal government is responsible pursuant to the cost-sharing provisions of the Stafford Act.

Community Disaster Loan Program
The Stafford Act authorizes FEMA to make community disaster loans to help local governments that have incurred significant revenue losses due to a presidentially declared major disaster if necessary for a local government to perform its governmental functions

Fire Management Assistance Grant Program (FMAG)
The FMAG is available to State, Tribal, and local governments for the mitigation, management, and control of fires on publicly or privately-owned lands.

Hazard Mitigation Grant Program (HMGP)
The HMGP provides grants to States, Territories, Tribes, local governments, and private nonprofit organizations to implement long-term hazard mitigation measures after a Declaration.

Individual Assistance Programs (IA)
The Stafford Act authorizes a wide variety of direct and financial assistance to individual and households affected by a Declaration, and FEMA has implemented these authorities under the umbrella of its Individual Assistance Program, which include crisis counseling (Section 416); disaster legal services (Section 415); unemployment assistance (Section 410); food coupons (Section 412); case management (Section 426); and funeral services, minor home repairs, and temporary housing assistance (Section 408). It should be noted that other Federal agencies provide disaster assistance programs, services, and activities to individuals as well, including the U.S. Small Business Administration, U.S. Department of Agriculture, and U.S. Department of Labor, but these other assistance programs are not subject to the terms of this Agreement.

Public Assistance Program (PA)
The Stafford Act authorizes federal assistance for state, territorial, tribal, and local governments and certain private non-profit entities to respond to emergencies and to respond to and recover from major disasters. FEMA has administratively combined these authorities under the umbrella of its Public Assistance Program. The Public Assistance Program provides a broad range of assistance. First, it provides direct services and financial assistance for emergency assistance,

such as emergency evacuation, sheltering, and debris removal. Second, it provides financial assistance for the permanent restoration of disaster-damaged facilities. Third, it includes emergency transportation and emergency communications assistance.

Mitigation Programs

Community Assistance Program – State Services Support Elements (CAP-SSSE)
The CAP-SSSE Program provides financial assistance to states to provide technical assistance to communities in the National Flood Insurance Program (NFIP) and to evaluate community performance in implementing NFIP floodplain management activities.

Cooperating Technical Partners Program (CTP)
The CTP Program provides financial assistance to states, local and Tribal governments, institutions of higher education, and other organizations to build upon and enhance the existing capabilities of these entities to increase local involvement in, and ownership of flood hazard identification, flood map maintenance, risk assessment, and risk communication to encourage responsible floodplain management and support their jurisdictional responsibilities as participating members of the NFIP.

Flood Mitigation Assistance Program (FMA)
The FMA Program provides grants to States, Territories, Tribal entities, and local governments for planning and carrying out activities designed to reduce the risk of flood damage to structures covered under contracts for flood insurance under the National Flood Insurance Program (NFIP).

National Dam Safety Program (NDSP)
The NDSP provides financial assistance to states to strengthen their dam safety programs, to include activities such as dam safety training, increasing dam inspections, increasing the submission and testing of emergency action plans, coordinating with state preparedness officials, identification of dams to be repaired or removed, and conducting dam safety awareness workshops.

National Earthquake Hazard Reduction Program (NEHRP)
The NEHRP provides financial assistance to certain organizations to mitigate earthquake losses in the United States through basic and directed research and implementation activities.

Pre-Disaster Mitigation Program (PDM)
The PDM Program provides competitive grants to States, Territories, Tribes, and local governments for mitigation planning and the project implementation.

Resilience Programs

Assistance to Firefighters Grant Program (AFG)
The AFG program provides funding for purchase of equipment and retrofit or construction of fire stations to improve first responder capabilities.

Emergency Management Performance Grants (EMPG)
The purpose of the EMPG is to provide Federal funds to states to assist state, local, territorial, and tribal governments in preparing for all hazards emergency preparedness capabilities.

Homeland Security Grant Program (HSGP)
The HSGP plays an important role in the implementation of the National Preparedness System by providing funding to states and urban areas to prevent, protect against, mitigate, respond to, and recover from acts of terrorism and other threats. HSGP is comprised of three interconnected grant programs.: (1) the State Homeland Security Program (SHSP), (2) the Urban Areas Security Initiative (UASI), and (3) the Operation Stonegarden (OPSG). Together, these grant programs and other future projects that may be included under the HSGP fund a range of preparedness activities, including planning, organization, equipment purchase, training, exercises, management, and administration.

State Homeland Security Program (SHSP)
The SHSP supports state, trihal, territorial, and local preparedness activities that address high priority preparedness gaps across all core capabilities that support terrorism preparedness.

Urban Areas Security Initiative (UASI) Program
The UASI program assists high-threat, high-density Urban Areas in efforts to build, sustain, and deliver the capabilities necessary to prevent, protect against, mitigate, respond to, and recover from acts of terrorism.

Operation Stonegarden (OPSG)
The OPSG Program supports enhanced cooperation and coordination among Customs and Border Protection (CBP), United States Border Patrol (USBP), and Federal, state, local, tribal, and territorial law enforcement agencies. The OPSG Program provides funding to support joint efforts to secure the United States' borders along routes of ingress from international borders to include travel corridors in states bordering Mexico and Canada, as well as states and territories with international water borders.

Intercity Bus Security Grant Program (IBSGP)
The IBSGP provides funding to strengthen the Nation's critical infrastructure against risks associated with potential terrorist attacks. IBSGP provides funding for critical infrastructure hardening and other physical security enhancements to support transit operators serving the Nation's highest-risk metropolitan areas.

Intercity Passenger Rail – Amtrak (IPR) *Program*
Provides funds to protect critical surface transportation infrastructure and the traveling public from acts of terrorism and increase the resilience of the Amtrak rail system.

Integrated Public Alert and Warning System (IPAWS)
The Integrated Public Alert and Warning System (IPAWS) was established by Executive Order 13407 in 2006. In the event of a national emergency, the President may use IPAWS to send a message to the American people quickly and simultaneously through multiple communications

pathways. FEMA has identified several radio transmission sites across the nation with significantly powerful signals for this purpose, and FEMA is responsible for upgrading, maintaining, and managing the agency installed and owned auxiliary fuel systems at each of these radio transmission sites.

Nonprofit Security Grant Program (NSGP)
NSGP provides funding in order to integrate the preparedness activities of nonprofit organizations that are at high risk of a terrorist attack with broader state and local preparedness efforts.

Port Security Grant Program (PSGP)
The PSGP provides funding to port authorities, facility operators, and State and local agencies for activities associated with implementing Area Maritime Security Plans (AMSPs), facility security plans and other port-wide risk management efforts. PSGP funds are intended to improve port-wide maritime security risk management; enhance maritime domain awareness; support maritime security training and exercises; and maintain or reestablish maritime security mitigation protocols that support port recovery and resiliency capabilities with a focus on weapons of mass destruction, cybersecurity, and attacks on soft targets.

Staffing for Adequate Fire and Emergency Response Grant Program (SAFER)
The SAFER Program provides financial assistance to fire departments and volunteer firefighter interest organizations to help them increase or maintain the number of training front line firefighters available in their communities.

Transit Security Grant Program (TSGP)
The TSGP provides funds to eligible public transportation systems (which include intra-city bus, ferries and all forms of passenger rail) for the protection of critical transportation infrastructure and the travelling public from acts of terrorism and to increase the resilience of transit infrastructure.

Tribal Homeland Security Grant Program (THSGP)
THSGP provides funding directly to eligible tribes to support the building, sustainment, and delivery of core capabilities to enable Tribes to strengthen their capacity to prevent, protect against, mitigate, respond to, and recover from potential terrorist attacks.

Appendix B

Programmatic Allowances

This list of Programmatic Allowances enumerates FEMA funded activities that based on FEMA experience have no or minimal effect on historic properties if implemented as specified in this Appendix, and will not require review by the SHPO and participating Tribe(s).

The Programmatic Allowances consist of two tiers – First Tier and Second Tier. Staff may apply First Tier Allowances whether or not they meet professional historic preservation qualification standards, while only staff meeting the applicable Secretary of Interior's (SOI) Professional Qualifications Standards in accordance with Stipulation I.B.1.a. of this Agreement may apply Second Tier Allowances.

When referenced in the Programmatic Allowances, "in-kind" shall mean that the result of the work shall match all physical and visual aspects of existing materials, including design, form, color, finish, texture, workmanship, and to the greatest extent possible, the materials. "In-kind" mortar will also match the strength and joint tooling of existing mortar, as appropriate. The "in-kind" repair provided for in both First and Second Tier Allowances in Appendix B should be limited to pre-existing architectural features and physical components of buildings and structures.

When referenced in the Allowances, "previously disturbed soils" shall refer to soils that have been changed from their natural depositional condition by excavation or other means (human or natural), and because of that disturbance, are not likely to possess intact and distinct soil horizons, and have the reduced likelihood of possessing historic properties within their original depositional contexts in the area and to the depth to be excavated.

I. First Tier Allowanees

A. GROUND DISTURBING ACTIVITIES AND SITE MODIFICATION, when proposed activities described below substantially conform to the original footprint and/or are performed in previously disturbed soils, including the area where the activity is staged.

1. Debris and Snow Removal

   a. Debris removal and collection, including removal of snow, uprooted trees, limbs and branches from public rights-of-way and public areas, as well as the transport and disposal of such waste to existing licensed waste facilities or landfills. This includes the temporary establishment and expansion of non-hazardous debris staging, reduction, and disposal areas at licensed transfer stations, or existing hard-topped or graveled surfaces (e.g., parking lots, roads, athletic courts) but not the creation of new or temporary access roads.

b. Removal of debris from private property provided that buildings are not affected, ground disturbance is minimal and in-ground elements, such as driveways, walkways or swimming pools are left in place.

c. Chipping and disposal of woody debris by broadcasting within existing rights-of-way.

d. Sediment removal from man-made drainage facilities, including retention/detention basins, ponds, ditches, and canals, in order to restore the facility to its pre-disaster condition. The sediment may be used to repair eroded banks or disposed of at an existing licensed or permitted spoil site.

e. Dewatering flooded developed areas by pumping.

2. Temporary Structures and Housing

a. Staging, installation, and removal of temporary structures for use as school classrooms, offices, or temporary shelters for essential public service agencies, such as police, fire, rescue and medical care, as well as temporary housing for disaster personnel and survivors at the following types of locations:

i. Single units on private residential sites when all utilities are installed above ground or tie into pre-existing utility lines.

ii. Existing RV/Mobile Home Parks and campgrounds with pre-existing utility hookups.

iii. Paved areas, such as parking lots and paved areas at such facilities as conference centers, shopping malls, airports, industrial port facilities, business parks, and military bases when all utilities are installed above ground or tie into pre-existing utility lines.

iv. Sites that have been previously prepared for planned construction, such as land being developed for public housing, office buildings, city parks, ball fields, schools, etc. when all utilities are installed above-ground or tie into pre-existing utility lines.

v. Areas previously filled to depths of at least two feet or more dependent on the depth of proposed utility installation so that subsurface utilities can be installed within fill material.

b. Temporary repairs to single family, residential properties to ensure safe shelter with access to essential electrical supply, HVAC, hot water, natural gas and potable water, and protection from elements such as weatherproofing, and securing broken doors and windows.

3. Recreation and Landscaping

   a. Installation of temporary removable barriers.

   b. In-kind repairs, installation, or replacement, and minor upgrades/mitigation of bollards and associated protective barriers when in previously disturbed areas.

B. BUILDINGS AND STRUCTURES

1. Repair or retrofit of buildings less than 45 years old.

2. Removal of water by physical or mechanical means.

3. Installation of exterior security features and early warning devices on existing light poles or other permanent utilities.

4. Repair or replacement of contents within buildings less than 45 years old including furniture, movable partitions, computers, cabinetry, supplies, and equipment, and any other moveable items.

C. TRANSPORTATION FACILITIES, when proposed activities substantially conform to the original footprint and/or are performed in previously disturbed soils, including any staging areas.

1. Roads and Roadways

   a. Paving and repair of roads to pre-disaster geometric design standards and conditions using in-kind materials, shoulders medians, clearances, curbs, and side slopes. This Allowance does not include improvement to existing roadways and appurtenances.

   b. Construction of temporary emergency access roads in previously disturbed soils to allow for passage of emergency vehicles.

   c. Repairs to road slips and landslides that do not require grading of undisturbed soils on the up-hill side of the slip.

   d. Re-establishment, armoring and/or upgrading of existing roadway ditches.

   e. In-kind repair or replacement of traffic control devices such as traffic signs and signals, delineators, pavement markings, or traffic surveillance systems.

   f. Installation and removal of temporary traffic control devices, including pre-formed concrete barriers and fencings.

g. In-kind repair or replacement of roadway safety elements such as barriers, guardrails, and impact-attenuation devices. In the case of guardrails, the addition of safety end treatments is permitted.

2. Airports

a. In-kind repair or replacement of existing runway surfaces and features (e.g., asphalt, concrete, gravel, and dirt) and associated air transportation safety components and systems (e.g., lighting bars, beacons, signage and weather sensors).

3. Rail Systems

a. In-kind repair or replacement of safety components.

b. In-kind repair or replacement of existing track system and passenger loading areas.

D. FEES AND SERVICES

1. Reimbursement of a Subrecipient's insurance deductible, not to exceed $2,500.

II. Second Tier Allowances

A. GROUND DISTURBING ACTIVITIES AND SITE WORK, when proposed activities described below substantially conform to the original footprint and/or are performed in previously disturbed soils, including the area where the activity is staged.

1. Footings, Foundations, Retaining Walls, Slopes, and Slope Stabilization Systems

a. In-kind repair, replacement, and reinforcement of footings, foundations, retaining walls, slopes, and slope stabilization systems (e.g., gabion baskets, crib walls, soldier pile and lag walls) if related ground disturbing activities are within the boundary of previously disturbed soils.

b. Installation of perimeter drainage (e.g., French drains) when performed in previously disturbed soils.

2. Recreation and Landscaping

a. In-kind repairs or replacement, and minor upgrades to recreational facilities and features (e.g., playgrounds, campgrounds, fire pits, dump stations and utility hook-ups, swimming pools, athletic fields and signage, batting cages, basketball courts, swing sets, pathways, simple wooden/wire stream crossings).

b. In-kind repair, replacement, and minor upgrades to landscaping elements (e.g., fencing, free standing walls, paving, planters, irrigation systems, lighting elements, signs, flag poles, ramps, steps).

c. Removal of fire or flood-damaged or destroyed standing trees within public rights-of-way, when trees are flush cut or stumps are ground to grade level, no root balls are removed, and all access and staging of equipment is within the existing hard surfaced public rights-of-way.

d. Repair or replacement of existing driveways, parking areas, parking lots, and walkways with materials of similar appearance in a manner that does not disturb historic landscape materials or features.

3. Piers, Docks, Boardwalks, Boat Ramps, and Dune Crossovers

a. In-kind repair and replacement and minor upgrades to existing piers, docks, boardwalks, boat ramps and dune crossovers in areas of previously disturbed soils.

4. Cemeteries

a. Removal of woody debris such as branches and limbs, from cemeteries, provided that heavy equipment and other machinery are not operated or staged on areas potentially containing human remains.

b. Resetting of toppled or settled grave stones, slabs, or monuments in the existing location when no associated repairs including repairs to address cracking, chipping, or other damages are proposed.

c. Removal of ash/soot from grave stones, slabs, or monuments provided that destructive treatments are not used including sand blasting, water blasting, or chemical cleaning.

5. Geotechnical Coring investigations for engineering and design purposes

a. Geotechnical coring investigations within the existing, disturbed road bed and/or within the footprint of a damaged facility. The Allowance does not apply to shovel testing, trenching, clearing, grubbing, or installation of new access routes or establishment of new staging locations.

b. Geotechnical coring investigations at locations determined to have low potential for the presence of archaeological deposits, or within previously disturbed soils as determined by a SOI qualified archaeologist including review of CHRIS records, applicable tribal coordination, geological information, and/or other information. The Allowance does not apply to shovel testing, trenching, clearing, grubbing, or installation of new access routes or establishment of new staging locations.

B. BUILDINGS AND STRUCTURES

1. Interior Work: Floors, Walls, Stairs, Ceilings and Trim

   a. In-kind repair and replacement of floors, walls, stairs, ceilings, and/or trim. The Allowance does not apply to decorative finishes, including murals, glazed paint, gold leaf, or ornamental plaster.

   b. Interior cleaning of surfaces using a weak solution of household bleach and water, mold remediation, or mold removal. The Allowance applies to interior finishes, including plaster and wallboard, provided the cleaning is restricted to damaged areas and does not affect adjacent materials.

   c. Non-destructive or concealed testing for hazardous materials (e.g., lead paint, asbestos) or for assessment of hidden damages.

2. Building Contents

   a. Repair or replacement of building contents including furniture, movable partitions, computers, cabinetry, supplies, and equipment, and any other moveable items which are not character-defining features of a historic property.

3. Utilities and Mechanical, Electrical, and Security Systems

   a. In-kind repair or replacement, or limited upgrading of interior utility systems, including mechanical (e.g., heating, ventilation, air conditioning), electrical, and plumbing systems. This Allowance does not provide for the installation of new exposed ductwork.

   b. Elevation of heating, ventilation, and air conditioning system (HVAC) and mechanical equipment as long as it is placed or located where it is not visible from the street.

   c. Installation or replacement of interior fire detection, fire suppression, or security alarm systems. The Allowance does not apply to surface-mounted wiring, conduits, piping, etc., unless previously existing, provided that installation of the system hardware does not damage or cause the removal of character-defining architectural features and can be easily removed in the future.

   d. Installation of communication and surveillance security systems, such as cameras, closed-circuit television, alarm systems, and public address systems, provided that installation of the system hardware does not damage or cause the removal of character-defining architectural features and can he easily removed in the future.

   e. Installation of building access security devices, such as card readers, enhanced locks, and security scanners (e.g., metal detectors), provided the device does not

damage or cause the removal of character-defining architectural features and can be removed in the future without impacts to significant architectural features.

4. Windows and Doors

   a. In-kind repair of damaged or severely deteriorated windows and window frames, shutters, storm shutters, doors and door frames, and associated hardware, where profiles, elevations, details and materials match those of the originals.

   b. In-kind replacement of window panes. Clear plate, double, laminated or triple insulating glazing can be used, provided it does not result in altering the existing window material, tint, form, muntin profiles, or number of divided lights. This Allowance does not apply to the replacement of intact decorative glass.

   c. Replacement of exterior, utilitarian, non-character-defining metal doors and frames leading into non-character-defining spaces with metal blast resistant doors and frames.

   d. Installation of security bars over windows on rear elevations.

5. Exterior Walls, Cornices, Porches, and Foundations

   a. Exterior cleaning including the removal of ash and soot from structures using the gentlest means possible and, provided that destructive surface preparation treatments are not used, such as water blasting, sandblasting, power sanding and chemical cleaning. Low pressure washing may be used to remove ash and soot, with power washing of historic masonry elements limited to the lowest psi possible, but not to exceed 300-400 psi. Should power washing greater than 300-400 psi be proposed for historic masonry, the decision regarding the proper psi level would be determined by a qualified professional. See National Park Service (NPS) Preservation Brief 1: *Assessing Cleaning and Water-Repellent Treatments for Historic Masonry Buildings*, and NPS Preservation Brief 6: *Dangers of Abrasive Cleaning to Historic Buildings.*

   b. In-kind repainting of surfaces, provided that destructive surface preparation treatments are not used, such as water blasting, sandblasting, power sanding and chemical cleaning.

   c. In-kind repair of walls, porches, foundations, columns, cornices, siding, balustrades, stairs, dormers, brackets, trim, and their ancillary components, or in-kind replacement of severely deteriorated or missing or lost features, as long as the replacement pieces match the original in detail and material. Any ground disturbance will be limited to previously disturbed soils.

   c. In-kind repair or replacement of signs or awnings.

d. Installation of temporary stabilization bracing or shoring, provided such work does not result in additional damage.

e. In-kind repair of concrete and masonry walls, columns, parapets, chimneys, or cornices, or limited in-kind replacement of damaged components including comparable brick, and mortar that matches the color, strength, content, rake, and joint width.

f. Repairs to and in-kind replacement of elements of curtain wall assemblies or exterior cladding that is hung on the building structure, usually from floor to floor, and when the color, size, reflectivity, materials, and visual patterns are unaltered.

6. Roofing

a. Installation of scaffolding, polyethylene sheeting, or tarps, provided such work will not result in additional damage or irreversible alterations to character-defining features.

b. In-kind repair, replacement, or strengthening of roofing, rafters, fascia, soffits, gutters, verge boards, leader boxes, downspouts, or other damaged roof system components.

c. Repairs to flat roof cladding, including changes in roofing materials, where the repairs are not highly visible from the ground level.

7. Weatherproofing and Insulation

a. Caulking and weather-stripping to complement the color of adjacent surfaces or sealant materials.

b. In-kind repair or replacement of insulation systems, provided that existing interior plaster, woodwork, exterior siding, or exterior architectural detail is not altered.

8. Structural Retrofits, Anchoring, Bracing, Reinforcing, and Strengthening

a. The installation of the following retrofits/upgrades, provided such upgrades are not visible on the exterior, do not impact any interior character defining spaces or features, and do not impact storefront spaces readily visible from the exterior: wall bracing, braced and/or moment frames, plywood shear walls and/or bracing, foundation bolts, and cripple wall strengthening.

b. Anchoring of walls to floor systems, provided the anchors are embedded and concealed from exterior view.

c. Bracing and reinforcing of walls, chimneys and fireplaces, provided the bracing and reinforcing are either concealed from exterior view or reversible in the future.

d. Strengthening of foundations and the addition of foundation bolts, provided that visible new work is in-kind, including mortar that matches the color, content, strength, rake, and joint width where occurring.

e. The installation of the following retrofits/upgrades, provided that such upgrades are not visible on the exterior: attic bracing, cross bracing on pier-and-post foundations; fasteners; collar ties; gussets; tie downs; strapping and anchoring of mechanical, electrical, and plumbing equipment; concealed anchoring of furniture; installation of plywood diaphragms beneath first floor joists, above top floor ceiling rafters, and on roofs; and automatic gas shut-off valves.

f. Replacement, repair or installation of lightning rods.

9. Americans with Disabilities Act (ADA) Compliance

a. Installation of grab bars and other such minor interior modifications.

10. Safe Rooms

a. Installation of individual safe rooms within the property limits of a residence where the installation would occur within the existing building or structure or in previously disturbed soils.

11. Elevation, Demolition, and Reconstruction

a. Activities related to the elevation, demolition and/or reconstruction of buildings or structures less than 45 years of age so long as the proposed activities substantially conform to the original footprint and/or are performed in previously disturbed soils including any staging area, and the buildings or structures are not located within or adjacent to a National Register listed or eligible historic district.

b. Reconstruction or replacement of buildings over 45 years of age that were completely destroyed by fire so long as the proposed activities substantially conform to the original footprint and/or are performed in previously disturbed soils including any staging area, and the buildings or structures are not located within or adjacent to a National Register listed or eligible historic district.

C. TRANSPORTATION FACILITIES, when proposed activities substantially conform to the original footprint and/or are performed in previously disturbed soils, including the area where the activity is staged.

1. Roads and Roadways

a. Repair of roads to pre-disaster geometric design standards and conditions using in-kind materials, shoulders, medians, clearances, curbs, and side slopes. This Allowance permits minor improvement to meet current code and standards or

hazard mitigation measures, such as those designed to harden exposed surfaces, including the application of gravel armoring to side slopes and ditches.

b. In kind repair to historic paving materials for roads and walkways.

c. In-kind repair or replacement, or minor upgrade of culvert systems and arches beneath roads or within associated drainage systems, including provision of headwalls, riprap and any modest increase in capacity for the purposes of hazard mitigation or to meet current codes and standards, provided that the work substantially conforms to the existing footprint of the damaged facility and will be confined to the areas washed-out in the event. For stone or brick culverts or arches beneath roadways, this allowance only applies to in-kind repair.

d. In-kind repair or replacement of road lighting systems, including period lighting fixture styles.

e. In-kind repair or replacement of road appurtenances such as curbs, berms, fences, and sidewalks.

f. Stabilization of hazardous slopes within transportation rights-of-way. Stabilization methods include the installation of retaining walls and systems such as gabion baskets, crib walls, and soldier pile and lag walls. Work will not exceed the limits of the previously disturbed rights-of-way and will not take place within the boundary of any historic property listed or eligible for listing in the National Register. This allowance does not apply to any work in historic districts listed or eligible for listing in the National Register.

2. Bridges

a. Installation of a temporary (Bailey-type) bridge over an existing structure or at a previously disturbed location, such as a former bridge location, to allow passage of emergency vehicles.

b. In-kind repair or replacement of bridges and bridge components (e.g. abutments, wing walls, piers, decks, and fenders) in previously disturbed soils.

D. UTILITIES, COMMUNICATIONS SYSTEMS AND TOWERS, when proposed activities substantially conform to the original footprint and/or are performed in previously disturbed soils, including the area where the activity is staged.

1. General

a. In-kind repair or replacement, or minor upgrading, small scale realignment, and elevation of utilities and associated features and structures within previously disturbed soils of rights-of-way or utility corridors.

b. Installation of new utilities and associated features within existing rights-of-way.

c. Directional boring of new/replacement service line and related appurtenances involving boring or silt trenches within previously disturbed soils of rights-of-way or utility corridors.

d. In-kind repair or replacement, or minor upgrade of water towers provided activities take place within previously disturbed soils. Ground-level facilities may be added or expanded in previously disturbed areas. This Allowance does not apply to masonry water towers.

e. Repair or replacement of septic tanks, drain fields, or well pumps in previously disturbed soils.

2. Generators and Utilities

a. In-kind repair or replacement, or minor upgrades, elevation, and/or installation of generators, HVAC systems, and similar equipment provided activities occur within previously disturbed soils and any roof-mounted equipment is not visible from the ground level.

3. Communication Equipment/Systems and Towers

a. Acquisition, installation, or operation of communication and security equipment/systems that use existing distribution systems, facilities, or existing infrastructure right-of-way.

b. The collocation of communication and security equipment on existing towers and buildings/structures less than 45 year in age, provided that the work does not increase existing tower height or footprint by more than 10% and occurs within previously disturbed soils.

c. Enhancement, repair or replacement of existing communication towers and antenna structures provided the work does not increase existing tower height or footprint by more than 10% and occurs within previously disturbed soils.

d. Installation of new temporary (not to exceed 12 months) communications towers and antenna structures provided that the work does not require modification of buildings/structures 45 years or older and occurs within previously disturbed soils.

e. Installation of new communication towers, less than 200 feet tall, in previously developed urban complexes when the work does not require modification of buildings/structures 45 years or older, occurs within previously disturbed soil, and is not within 1,000 feet of the boundaries of a historic property.

E. WATER RESOURCE MANAGEMENT AND CONTROLS, when proposed activities substantially conform to the original footprint and/or are performed in previously disturbed soils, including the area where the activity is staged.

1. Canal Systems

    a. In-kind repairs or replacement to canal systems and associated elements.

2. Breakwaters, Seawalls, Revetments, and Berms

    a. In-kind repair or replacement of breakwaters, seawalls, and revetments, provided the work occurs in previously disturbed soils.

3. Dams, Levees, and Floodwalls

    a. In-kind repair of dams, levees, floodwalls and related features, including spillways, tide gates, and fuse plugs, provided the work occurs in previously disturbed soils.

4. Fish Hatcheries

    a. In-kind repair or replacement of fish hatcheries and fish ladders.

5. Waste-Water Treatment Lagoon Systems

    a. In-kind repair or replacement, or minor upgrades of waste-water treatment lagoon systems.

F. WILDFIRE RECOVERY AND MITIGATION, when proposed activities substantially conform to the original footprint and/or are performed in previously disturbed soils, including the area where the activity is staged.

1. Re-seeding

    a. Aerial seeding by fixed or rotary wing aircraft to re-establish vegetative ground cover after a wildfire.

    b. Hydro-seeding and/or placement of jute matting or other similar measures as appropriate and limited to heavily sloped and erodible areas, with minimal potential ground disturbance limited to surface soils only.

2. Creation of Defensible Space

    a. Creation of defensible space around private and public structures in the wildland interface through selective vegetation removal including limbing low branches, brush thinning and removal, clearing of leaves and pine needles on the ground surface, and limited thinning of small understory trees using hand-held tools,

chainsaws, and/or small rubber-tired, non-tracked, mechanized equipment fitted with a mower or masticator deck. The defensible space zone typically extends approximately 100 feet from the structure, but no more than approximately 200 feet in steep sloped areas. Equipment will be staged on improved surfaces to the maximum extent possible. Treatment areas will be accessed from existing roads and driveways.

b. Creation of defensible space within 10' of an existing roadway through selective vegetation removal including limbing low branches, brush thinning and removal, and limited thinning of small understory trees using hand-held tools, chainsaws, and/or small rubber-tired, non-tracked, mechanized equipment fitted with a mower or masticator deck. Equipment will be staged on improved surfaces to the maximum extent possible.

c. Cutting and felling of trees 12 inches or less in diameter at breast height, and grinding stumps leaving root balls intact, within 30 feet of a public or private structure for the purpose of establishing defensible space. Trees will be cut in place using a chainsaw or hand tools, and removed from the property by hand, not dragged, to a debris stockpile area for use as firewood, chipped, or hauled to and disposed of at an approved solid waste facility.

d. Chipping and broadcasting of vegetative debris on site beyond the defensible space zone, piling (with limited burning possible), or hauling to and disposing of at an approved solid waste facility.

3. Vegetative Fuels Thinning Within Established Parks and Designated Open Space in the Wildland-Urban Interface

a. Use of goats or sheep to graze on vegetative materials within a fenced area to reduce above-surface plant materials.

b. Selective vegetation removal including limbing low branches, brush thinning and removal, clearing of leaves, and limited thinning of small understory trees using hand-held tools, chainsaws, and/or small rubber-tired, non-tracked, mechanized equipment fitted with a mower or masticator deck. Treatment areas will be accessed from and equipment will be staged on existing surfaces such as park roads and trails.

c. Cutting and felling of trees 12 inches or less in diameter at breast height using a chainsaw or hand tools, and either left in place or removed from the property by hand, not dragged, to a debris stockpile area on an existing surface to be chipped or hauled to and disposed of at an approved solid waste facility.

d. Chipping and broadcasting of vegetative debris on site using a small rubber-tired, non-tracked, chipper or hauling to and disposing of at an approved solid waste

facility. Use of rubber-tired equipment will be limited to use during the dry season.

4. Wildfire-Resistant Structure Hardening

   a. Installation of a removable spark arrester on chimney and/or stovepipe outlets.

Appendix C

Treatment Measures

When avoidance or minimization of adverse effects is not appropriate, the following Treatment Measures are suggested for the resolution of adverse effects:

If Undertakings may or will result in adverse effects, FEMA, the Recipient(s), Subrecipient, SHPO, and participating Tribes(s) may develop a treatment measure plan that includes one or more of the following Treatment Measures, depending on the nature of historic properties affected and the severity of adverse effects. This Appendix may be amended in accordance with Stipulation IV.A.3. of this Agreement, Amendments.

A. Recordation

1. Digital Photography Package: Prior to project implementation, the designated responsible party shall oversee the successful delivery of a digital photography package prepared by staff or contractors meeting the Secretary's Professional Qualifications for Architectural History, History, Architecture, or Historic Architecture, as appropriate. The digital photography package will meet the standards cited in the NPS's *National Register of Historic Places Photographic Policy March 2010* or subsequent revisions (http://www.nps.gov/nr/publications/bulletins/photopolicy/index.htm).

   a. The digital photography package shall include a comprehensive collection of photographs of both interior and exterior views showing representative spaces and details of significant architectural features and typical building materials. Exterior photographs shall include full oblique and contextual images of each elevation. Exterior views shall be keyed to a site plan while interior views shall be keyed to a floor plan of the building/structure. The photographs shall be indexed according to the date photographed, site number, site name, site address, direction, frame number, subject matter and photographer's name recorded on the reverse side in pencil.

   b. The digital photography package shall include printed color copies of the digital photographs (on appropriate paper, per the NPS *Photographic Policy*), a CD/DVD of the digital photographs, a completed state architectural inventory form, and a written site history of the historic property.

   g. The designated responsible party shall submit the digital photography package to the SHPO and participating Tribe(s) for review and approval. Once approved by the SHPO and participating Tribe(s), the designated responsible party shall submit a copy of the approved documentation to a state or local historical society, archive, and/or library for permanent retention.

2. 35mm Black and White Photography Package: Prior to project implementation, the designated responsible party shall oversee the successful delivery of a 35 mm black and white film photography package prepared by staff or contractors meeting the Professional Qualifications for Architectural History, History, Architecture, or Historic Architecture, as appropriate.

   a. The 35 mm black and white film photography package shall include a comprehensive collection of photographs of both interior and exterior views showing representative spaces and details of significant architectural features and typical building materials. Exterior photographs shall include full oblique and contextual images of each elevation. Exterior views shall be keyed to a site plan while interior views shall be keyed to a floor plan of the building/structure. The photographs shall be indexed according to the date photographed, site number, site name, site address, direction, frame number, subject matter and photographer's name recorded on the reverse side in pencil.

   b. The 35 mm black and white film photography package shall include one (1) full set of 35mm black and white film photographs printed on acid free paper, the corresponding 35mm film negatives in acid free sleeves, a completed state architectural inventory form, and a written site history of the historic property.

   c. The designated responsible party shall submit the 35 mm black and white film photography package to the SHPO and/or participating Tribe(s) for review and approval. Once approved by the SHPO and/or participating Tribe(s), the designated responsible party shall submit a copy of the approved documentation to a state or local historical society, archive, and/or library for permanent retention.

3. Large Format Photography Package: Prior to project implementation, the designated responsible party shall oversee the successful delivery of a large format photography package prepared by staff or contractors meeting the Professional Qualifications for Architectural History, History, Architecture, or Historic Architecture, as appropriate.

   a. The large format photography package shall include a comprehensive collection of photographs of both interior and exterior views showing representative spaces and details of significant architectural features and typical building materials. Exterior photographs shall include full oblique and contextual images of each elevation. Exterior views shall be keyed to a site plan while interior views shall be keyed to a floor plan of the building/structure. The photographs shall be indexed according to the date photographed, site number, site name, site address, direction, frame number, subject matter and photographer's name recorded on the reverse side in pencil.

   b. The large format film photography package shall include one (1) full set of 4 x 5 or 5 x 7-inch photographs printed on acid free paper, the corresponding 4 x 5 or 5 x 7-inch negatives in acid free sleeves, a completed state architectural inventory form, and a written site history of the historic property.

c. The designated responsible party shall submit the large format film photography package to the SHPO and/or participating Tribe(s) for review and approval. Once approved by the SHPO and/or participating Tribe(s), the designated responsible party shall submit copies of the approved documentation to a state or local historical society, archive, and/or library for permanent retention.

B. Public Interpretation

Prior to project implementation, FEMA, the Recipient(s), and Subrecipient shall work with the SHPO and/or participating Tribe(s) to design an educational interpretive plan. The plan may include signs, displays, educational pamphlets, websites, workshops and other similar mechanisms to educate the public on historic properties within the local community, state, or region. Once an interpretive plan has been agreed to by the parties, the SHPO and/or participating Tribes, the designated responsible party shall continue to consult throughout implementation of the plan until all agreed-upon actions have been completed by the designated responsible party.

C. Historical Context Statements and Narratives

Prior to project implementation, FEMA, the Recipient(s), and Subrecipient shall work with the SHPO and participating Tribe(s) to determine the topic and framework of a historic context statement or narrative that the designated responsible party shall be responsible for completing. The statement or narrative may focus on an individual property, a historic district, a set of related properties, or relevant themes as identified in the statewide preservation plan. Once the topic of the historic context statement or narrative has been agreed to, the designated responsible party shall continue to coordinate with the SHPO and participating Tribe(s) through the drafting of the document and delivery of a final product. The designated responsible party shall use staff or contractors that meet the Professional Qualifications for the appropriate discipline.

D. Oral History Documentation

Prior to project implementation, FEMA, the Recipient(s), and Subrecipient shall work with the SHPO and/or participating Tribe(s) to identify oral history documentation needs and agree upon a topic and list of interview candidates. Once the parameters of the oral history project have been agreed upon, the designated responsible party shall continue to coordinate with the SHPO and/or participating Tribe(s) through the data collection, drafting of the document, and delivery of a final product. The designated responsible party shall use staff or contractors that meet the Professional Qualifications for the appropriate discipline.

E. Historic Property Inventory

Prior to project implementation, FEMA, the Recipient(s), and Subrecipient shall work with the SHPO and/or participating Tribe(s) to establish the appropriate level of effort to

accomplish a historic property inventory. Efforts may be directed toward the resurvey of previously-designated historic properties and/or districts which have undergone change or lack sufficient documentation, or the survey of new historic properties and/or districts that lack formal designation. Once the boundaries of the survey area have been agreed upon, the designated responsible party shall continue to coordinate with the SHPO and/or participating Tribe(s) through the data collection process. The designated responsible party shall use SHPO and/or participating Tribe(s) standards for the survey of historic properties and SHPO and/or participating Tribe(s) forms as appropriate. The designated responsible party shall prepare a draft inventory report, according to SHPO and/or participating Tribe(s) templates and guidelines, and work with the SHPO and/or participating Tribes until a final property inventory is approved. The designated responsible party shall use staff or contractors that meet the Professional Qualifications for the appropriate discipline.

F. National Register and National Historic Landmark Nominations

Prior to project implementation, FEMA, the Recipient(s), and Subrecipient shall work with the SHPO and/or participating Tribes to identify the individual properties that would benefit from a completed National Register or National Historic Landmark nomination form. Once the parties have agreed to a property, the designated responsible party shall continue to coordinate with the SHPO and/or participating Tribes through the drafting of the nomination form. The SHPO and/or participating Tribe(s) shall provide adequate guidance to the designated responsible party during the preparation of the nomination form, and shall formally submit the final nomination to the Keeper for inclusion in the National Register. The designated responsible party shall use staff or contractors that meet the Professional Qualifications for the appropriate discipline.

G. Geo-References of Historic Maps and Aerial Photographs

Prior to project implementation, FEMA, the Recipient(s), and Subrecipient shall work with the SHPO and/or participating Tribe(s) to identify the historic maps and/or aerial photographs for scanning and geo-referencing. Once a list of maps and/or aerial photographs have been agreed upon, the designated responsible party shall continue to coordinate with the SHPO and/or participating Tribes through the scanning and geo-referencing process and shall submit drafts of paper maps and electronic files to the SHPO and/or participating Tribe(s) for review. The final deliverable produced by the designated responsible party shall include a paper copy of each scanned image, a geo-referenced copy of each scanned image, and the metadata relating to both the original creation of the paper maps and the digitization process.

H. Archaeological Sites: Archaeological Treatment Plan

1. In accordance with Stipulation II.C.6.a. of this Agreement, potential adverse effects to an archaeological property may be resolved through alternative mitigation measures to avoid or minimize adverse effects, or data recovery to recover important information that would have been otherwise lost as a result of an undertaking. FEMA staff or contractors that meet the Professional Qualifications for the appropriate discipline shall

determine applicability of an archaeological treatment plan (ATP), and as applicable, the appropriate level of documentation.

a. The ATP will provide detailed descriptions of protection measures for archaeological resources and resources of importance to Tribes or Tribal organizations because of cultural affinity. The ATP could include, but is not limited to the establishment of environmentally sensitive areas (ESAs), use of preconstruction archaeological excavation, preservation-in-place, avoidance, minimization, monitoring during construction where appropriate, procedures to be followed when unanticipated discoveries are encountered [see Stipulation III.B.], processes for revaluation and data recovery of discoveries, responsibilities and coordination with Tribes and Tribal organizations, NAGPRA compliance [Stipulation III.B.1.c.], and curation of recovered materials [Stipulation III.C.].

b. The ATP will address historic properties adversely affected and set forth means to avoid, protect, or develop treatment measures to minimize the Undertaking's effects where FEMA, the SHPO, participating Tribe(s), and other consulting parties determine that adverse effects cannot be avoided. The ATP will conform to the principles of the ACHP's *Treatment of Archaeological Properties: A Handbook Parts I and II*, the *Secretary of the Interior's Guidelines for Archeology and Historic Preservation* (Federal Register, Vol. 48, September 29, 1983, pp. 44716-44742) and appropriate SHPO Guidelines. FEMA will take into consideration the concerns of the consulting parties in determining the measures to be implemented.

c. Where data recovery is proposed, each ATP may include, but not be limited to:

   i. Recovery of a reasonable sample of the intact archaeological deposits from National Register eligible archaeological sites that the agency determines, through the process set out in Stipulation II.C.6. of this Agreement, may be adversely affected by the implementation of the Undertaking;

   ii. Specify the research issues/questions to be addressed through the recovery of data and explain how data from the historic property will address those research issues/questions;

   iii. Specify methods to be used in fieldwork and analysis, and explain how these methods are relevant to the research issues/questions;

   iv. Indicate how recovered materials and records will be curated, taking into account the expressed wishes of the participating Tribes;

   v. Include a schedule for providing the participating Tribes with periodic updates on implementation of the data recovery plan;

   vi. If applicable, include the curation agreement in accordance with applicable laws and regulations;

vii. Specify the manner in which human remains and grave-associated artifacts recovered during data recovery will be treated according to applicable laws and regulations, taking into account the expressed wishes of participating Tribes; and

viii. Clarify the public benefit that will be achieved from the ATP.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

In Reply Refer to:
08ESMF00-
2018-F-3331-1

MAR 2 7 2019

Mr. Alessandro Amaglio
Regional Environmental Officer, Region IX
Federal Emergency Management Agency
1111 Broadway, Suite 1200
Oakland, California 94607

Subject: Programmatic Formal Section 7 Consultation on Federal Emergency Management Agency's Disaster, Mitigation, and Preparedness Programs within the Sacramento Fish and Wildlife Office's Jurisdiction, California

Dear Mr. Amaglio:

This letter is in response to the Federal Emergency Management Agency's (FEMA) request to initiate formal section 7 consultation under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act), and provides the U.S. Fish and Wildlife Service's (Service) programmatic biological opinion on FEMA's Disaster, Mitigation, and Preparedness Programs (proposed project) in California as described in FEMA's June 20, 2018 *Programmatic Biological Assessment for Disaster, Mitigation, and Preparedness Programs in California* (programmatic biological assessment). We received your June 20, 2018, letter requesting initiation of consultation in our Sacramento Fish and Wildlife Office (SFWO) on June 20, 2018. On September 14, 2018, we received a letter from FEMA changing effects determinations for 20 species. At issue are the effects of FEMA's proposed action on 35 federally-listed species and their designated or proposed critical habitats which the Sacramento Fish and Wildlife Office has lead responsibility and seven federally-listed species and their critical habitat which occur within the jurisdiction of the Sacramento Fish and Wildlife Office but for which other Service field offices have lead responsibility. FEMA requested formal consultation based on your determination that the proposed project may affect, and is likely to adversely affect the following 17 federally-listed species and their designated critical habitat, and may affect, but not likely to adversely affect the following 25 federally-listed species and their designated critical habitat.

Sacramento Fish and Wildlife Office Species

Likely to Adversely Affect

California red-legged frog (*Rana draytonii*) (Threatened) and critical habitat
California tiger salamander (*Ambystoma californiense*)
- Central California DPS (Threatened) and critical habitat
- Sonoma DPS (Endangered) and critical habitat

Giant garter snake (Threatened) (*Thamnophis gigas*)
Alameda whipsnake (*Masticophis lateralis euryxanthus*) (Threatened) and critical habitat
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (Threatened) and critical habitat

California freshwater shrimp (*Syncaris pacifica*) (Endangered)
Bay checkerspot butterfly (*Euphydryas editha bayensis*) (Threatened) and critical habitat
Callippe silverspot butterfly (*Speyeria callippe callippe*) (Endangered)
Myrtle's silverspot butterfly (*Speyeria zerene myrtleae*) (Endangered)
Vernal pool fairy shrimp (*Branchinecta lynchi*) (Threatened) and critical habitat
Vernal pool tadpole shrimp (*Lepidurus packardi*) (Endangered) and critical habitat
Conservancy fairy shrimp (*Branchinecta conservatio*) (Endangered) and critical habitat
Longhorn fairy shrimp (*Branchinecta longiantenna*) (Endangered) and critical habitat
Sacramento Orcutt grass (*Orcuttia viscida*) (Endangered) and critical habitat

Not Likely to Adversely Affect
Mission blue butterfly (*Icaricia icarioides missionensis* [= *Plebejus icarioides missionensis*]) (Endangered)
San Bruno elfin butterfly (*Callophrys mossii bayensis*) (Endangered)
Burke's goldfields (*Lasthenia burkei*) (Endangered)
Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*) (Endangered) and critical habitat
Calistoga allocarya (*Plagiobothrys strictus*) (Endangered)
Colusa grass (*Neostapfia colusana*) (Threatened) and critical habitat
Contra Costa goldfields (*Lasthenia conjugens*) (Endangered) and its critical habitat
Few-flowered navarretia (*Navarretia leucocephala* ssp. *pauciflora* [=*N. pauciflora*]) (Endangered)
Fleshy owl's-clover (*Castilleja campestris* ssp. *succulenta*) (Threatened) and critical habitat
Greene's tuctoria (*Tuctoria greenei*) (Endangered) and critical habitat
Hairy Orcutt grass (*Orcuttia pilosa*) (Endangered) and critical habitat
Hoover's spurge (*Chamaesyce hooveri* [=*Euphorbia hooveri*]) (Threatened) and critical habitat
Lake County stonecrop (*Parvisedum leiocarpum* [=*Sedella leiocarpa*]) (Endangered)
Loch Lomond coyote thistle (*Eryngium constancei*) (Endangered)
Many-flowered navarretia (*Navarretia leucocephala* ssp. *plieantha*) (Endangered)
San Joaquin Orcutt grass (*Orcuttia inaequalis*) (Threatened) and critical habitat
Sebastopol meadowfoam (*Limnanthes vinculans*) (Endangered)
Slender Orcutt grass (*Orcuttia tenuis*) (Threatened) and critical habitat
Solano grass (*Tuctoria mucronata*) (Endangered) and critical habitat
Sonoma sunshine (*Blennosperma bakeri*) (Endangered)

<u>Carlsbad Fish and Wildlife Office Species</u>

Likely to Adversely Affect
Least bell's vireo (*Vireo bellii pusillus*) (Endangered)

May Affect, Not Likely to Adversely Affect
California least tern (*Sterna antillarum browni*) (Endangered)
Southwestern willow flycatcher (*Empidonax traillii extimus*) (Endangered) and critical habitat

<u>Ventura Fish and Wildlife Office Species</u>

Likely to Adversely Affect
Tidewater goby (*Eucyclogobius newberryi*) (Endangered) and critical habitat

<u>Arcata Fish and Wildlife Office Species</u>

May Affect, Not Likely to Adversely Affect
Western snowy plover (*Charadrius nivosus* ssp. *nivosus*) (Threatened) and critical habitat

Marbled murrelet (*Brachyramphus marmoratus*) (Threatened) and critical habitat

Yreka Fish and Wildlife Office Species

May Affect, Not Likely to Adversely Affect

Northern spotted owl (*Strix occidentalis caurina*) (Threatened) and critical habitat

Based on our review of the information provided in FEMA's June 20, 2018, programmatic biological assessment, the Service concurs that the proposed project may affect, but is not likely to adversely affect the 25 federally-listed species listed above and their respective critical habitat. The general avoidance and minimization measures and species-specific conservation measures will help ensure that adverse effects to the species from proposed project activities are likely to be insignificant. If any activity proposed by a FEMA Subapplicant (entity that has applied to receive a FEMA grant administered by the state or federally-recognized tribe) demonstrates the potential to adversely affect any of these 25 species or their critical habitat, that project will not be covered by this programmatic biological opinion and FEMA will submit that project for formal consultation.

The remainder of this document provides our programmatic biological opinion on the effects of the proposed action on the remaining 17 species.

This programmatic biological opinion is based on information provided in the following: (1) FEMA's *Programmatic Biological Assessment for Disaster; Mitigation, and Preparedness Programs in California*, dated June 20, 2018; (2) FEMA's September 14, 2018 letter changing effects determinations for 20 species; (3) conversations and emails between the Service (C. Martin and J. Knight) and FEMA staff or their contracted agents, (S. Amaglio, L. Solorzano-Vincent.); (4) conversations between FEMA and other Service biologists from the Ventura, and Arcata Fish and Wildlife Offices; and (4) information contained in Service files.

A complete administrative record of this consultation is on file at the Sacramento Fish and Wildlife Office (Service File No. 08ESMF00-2018-F-3331).

Consultation History

March 2017 – January 2018	Weekly coordination calls between the Sacramento Fish and Wildlife Office, other Service field offices, and FEMA.
March 2017 – May 2018	Correspondence exchange and meetings between the Sacramento Fish and Wildlife Office, other Service field offices, and FEMA.
January 11, 2018	Received the Draft Programmatic Biological Assessment from FEMA.
April 17, 2018	Received additional supplemental information for the Draft Biological Assessment.
May 2, 2018	Provided final comments on the Draft Programmatic Biological Assessment.
June 20, 2018	Received a Programmatic Biological Assessment from FEMA.

September 14, 2018 Received a letter from FEMA changing the effects determinations for 20 species from Likely to Adversely Affect to Adversely Affect.

PROGRAMMATIC BIOLOGICAL OPINION

Scope of the Consultation

This document is a programmatic biological opinion for FEMA's disaster, mitigation, and preparedness program (proposed action) within the Sacramento Fish and Wildlife Office's Jurisdiction in California. This is designed to facilitate FEMA's compliance with the Act for projects of a similar nature that occur as a result of Presidentially-declared disasters, and that are likely to adversely affect 17 federally-listed species and their respective designated or proposed critical habitats within the Sacramento Fish and Wildlife Office's jurisdiction. It is intended to provide Section 7(a)(2) compliance to FEMA for the proposed projects from applicants and sub-grantees (Subapplicants) requesting funding under FEMA's disaster, mitigation, and preparedness program in California. It does not cover emergency consultations or FEMA's implementation of the National Flood Insurance Program.

This programmatic biological opinion will cover a period of five years from the signature date of this document, with the potential for extension if warranted. When the 5-year period has expired or incidental take coverage under this programmatic biological opinion is met, FEMA may reinitiate a consultation to extend or amend the coverage provided in this programmatic biological opinion.

This programmatic biological opinion only applies to FEMA Subapplicants' proposed projects for which FEMA is the Lead Federal Agency for compliance under the Act. When FEMA and the U.S. Army Corps of Engineers (USACE) are both involved with a Subapplicant's proposed project, the process described in the 2015 Memorandum of Understanding (MOU) (executed in 2015, updated in 2018, and subsequent annual updates) among FEMA, USACE, Service, and NMFS will be followed to determine whether FEMA or the USACE is the lead federal agency for compliance with the Act.

Procedure to Cover Individual Projects Under this Programmatic Biological Opinion

To determine a Subapplicant's proposed project eligibility for coverage under this programmatic biological opinion, FEMA will determine whether a Subapplicant's proposed project meets the suitability criteria established under FEMA's programmatic biological assessment. If the proposed project meets the suitability criteria, FEMA will conduct a project-specific effects analysis and provide a summary of the potential direct and indirect effects associated with the covered project by submitting a completed ESA Review Form to the Service (Appendix C, programmatic biological assessment). If the covered project may result in adverse effects to species, the ESA Review Form will include:

- A brief description of the potential effects and mechanisms of take;
- A description of the general avoidance and minimization measures, the species-specific Conservation Measures, and any additional measures developed specifically for the project that the Subapplicant will implement; and
- A quantification of the incidental take anticipated.

FEMA will submit the completed ESA Review Form to the Service and request concurrence that the project is applicable for coverage under the programmatic biological opinion. The Service will

notify FEMA by electronic mail whether the Service does or does not concur with the proposed project's coverage under the programmatic biological opinion.

Description of the Proposed Programmatic Actions

Under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S. Code [U.S.C.] §§ 5121–5206), as amended, FEMA is authorized to provide grant funding to state and local governments, federally-recognized tribe and individuals (referred to as Subapplicants) who are adversely affected or potentially affected by human-caused or natural disasters. FEMA provides such grants to assist Subapplicants in repairing, restoring, or replacing disaster-damaged facilities, and to provide assistance with actions that will reduce or eliminate threats to public health and safety and reduce the risk of damage to public and private property during future disasters. FEMA has determined through experience with other disasters that the majority of the typically recurring actions proposed for funding can be grouped by type of action or location. Some of these projects may directly or indirectly affect federally-listed species and their designated or proposed critical habitats. FEMA's programmatic biological assessment contains a comprehensive description of all potential actions. These are summarized below.

Non-Emergency Debris Removal

For purposes of this document, debris removal performed in non-emergency situations includes:

- Removing rock, silt, sediment, or woody debris that floodwaters have deposited in harbors and ports, stream channels, bridge and culvert openings, canals, sedimentation basins, sewage treatment ponds, ditches, and other facilities in such a manner as to disrupt normal flows, navigation, recreation, or municipal services;
- Removing woody debris and other vegetation following events that damage or destroy trees;
- Removing rock and earth from landslides caused by events such as earthquakes or heavy rains; and
- Removing rubble after earthquakes.

All removed debris will be disposed of at approved and licensed disposal sites, in compliance with existing laws and regulations. Any hazardous materials or other contaminants will be removed and disposed of in an appropriate manner. If possible, woody debris and construction materials will be recycled.

Constructing, Modifying or Relocating Facilities

FEMA is authorized to provide funds for constructing, modifying, or relocating facilities. Relevant actions include:

- Upgrading or otherwise modifying facilities;
- Providing temporary facilities;
- Acquiring and demolishing existing facilities;
- Repairing, realigning, or otherwise modifying roads, trails, utilities, and rail lines;
- Constructing new facilities or relocating existing facilities;
- Relocating the function of an existing facility; and
- Developing demonstration projects.

During construction, avoidance and minimization measures are typically used and incorporated as part of the action. These typical measures are described later in this document.

Upgrading or Otherwise Modifying Facilities

FEMA may provide funds to implement changes required by current building codes and standards, or otherwise modify existing structures. Often, these changes make the structure more resistant to damage in future events. Typical activities include:

- Making structures more fire-resistant (e.g., by replacing roofs and doors with fire-resistant materials);
- Installing bracing, shear panels, shear walls, anchors, or other features so that structures are better able to withstand seismic events or high wind or snow loads;
- Modifying structures to reduce the risk of damage during floods by elevating structures above the expected flood level or by flood proofing; and
- Modifying structures to meet another need of a Subapplicant, such as through an improved project or an alternate project under the Public Assistance Program.

Providing Temporary Facilities

FEMA may provide temporary housing facilities when a disaster renders homes uninhabitable for long periods. Such facilities typically consist of manufactured housing. Typical activities may involve:

- Developing the pads for dwellings;
- Constructing ancillary facilities, such as roads, streets, and parking lots;
- Installing utilities, such as potable water lines, sewer hookups, electricity (including street lighting), and telephones lines; and
- Installing manufactured homes.

FEMA may provide temporary facilities if other housing options are not feasible. Appropriate sites will not be located in a floodplain and do not contain wetlands or critical habitat, affect historic properties or archaeological sites, or contain hazardous materials. Installation of housing units and utilities will be accomplished in accordance with current codes and standards. After temporary housing is no longer needed at the disaster site, FEMA will remove the temporary housing units and associated ancillary facilities, and restore the land to its original use. All removed materials will be stored for future use or disposed of in accordance with applicable laws and regulations.

Another method that FEMA uses to provide temporary housing involves modifying existing facilities to serve as temporary housing. These facilities may consist of existing residential property or the adaptive reuse of non-residential facilities. Specific activities range from conducting repairs and minor upgrades to complete reconstruction of a building's interior. This action may involve acquisition or leasing of facilities. Modifying existing facilities for temporary housing may be conducted by FEMA directly or by providing funding to a Subapplicant.

FEMA also may provide funding for temporary relocation of essential public services, in the event that the structures housing these services are damaged, destroyed, or otherwise rendered inaccessible by a disaster. Funds also may be provided for upgrades necessary to meet current codes and standards, and for the installation or modification of appurtenances, such as utilities, that are necessary to operate facilities.

Acquiring and Demolishing Existing Facilities

FEMA may provide funds for the acquisition and demolition of existing facilities, particularly if they are located in high-hazard areas and are subject to repetitive loss. Typically, these facilities are at a high risk because of: (1) damage from flooding; (2) erosion of stream banks, beaches, slopes, or bluffs; (3) landslides; or (4) wildfire. These facilities may consist of private properties, such as houses and commercial buildings, or publicly owned facilities, such as utilities, roads, and bridges.

Existing facilities will be either removed or demolished. All demolition materials will be disposed of at approved and licensed disposal sites, in compliance with applicable laws and regulations. Any hazardous materials or other contaminants will be removed and disposed of in an appropriate manner. Construction debris and household materials may be recycled if recycling facilities exist. Once structures are removed, lots will be graded to conform to the local topography, and disturbed areas will be revegetated with species approved for the local area.

Repairing, Realigning or Otherwise Modifying Roads, Trails, Utilities and Rail Lines

Roads, trails, utilities (water, sewer, natural gas, power/electrical systems infrastructure), and rail lines are typically damaged when floods or heavy rains cause erosion, subsidence, or landslides. Earthquakes may cause similar damage. Repairs are accomplished by replacing earthen material lost during the disaster and replacing the damaged surface, utility line, or, in the case of rail lines, ballast, and track. Stabilizing the replacement fill using rock, grout, timber walls, or steel sheet piling may be necessary. Hazard mitigation measures may be performed to prevent or limit future damage. For example, a pipe may be installed to convey drainage beneath a road, thus preventing future washouts, or a utility line may be encased in concrete in an area vulnerable to erosion.

If the area of damage is unstable, does not allow for repair, or is subject to repetitive loss, a facility may be realigned so that the area of damage is avoided. Property acquisition or a change in easement may be necessary.

Facilities may also be modified as part of improved projects or alternate projects under the Public Assistance Program to meet additional needs of the Subapplicant.

Constructing New Facilities or Relocating Existing Facilities

If a facility is located in a floodplain or other hazardous area, is subject to repetitive damage, or has been damaged in such a way that restoration in the current location is not practical or cost-effective, FEMA may fund the construction of a new facility or the physical relocation of the existing facility. FEMA defines hazardous areas as those areas susceptible to some type of natural hazard, such as flooding, seismic activity, coastal inundation, or mudslide. Examples of this action include construction of roads, trails, utilities and utility lines, and rail lines in a different area from the existing facility; construction and relocation of buildings; construction of safe rooms; and construction of drainage improvements.

In both new facility construction and physical relocation, FEMA may fund the cost of land acquisition and the construction of appurtenant features, such as access roads and utilities. For properties in the hazard area, FEMA acquires damaged properties, demolishes existing structures (except in cases of physical relocation), and places deed restrictions that limit future uses to open space in perpetuity. However, FEMA does not acquire land directly nor does it become a land owning agency as a result of this process.

Relocating the Function of an Existing Facility

FEMA may fund relocating the function of a facility to an existing facility that has adequate capacity to handle the additional load with minor modifications, if necessary. For structures, the occupants and materials are relocated to alternative structures, traffic may use alternate routes, and utility services are provided by alternative methods. This action will not entail any major physical construction or addition to the existing facility and, if any work is required, it will consist only of minor modifications. For properties in the hazard area, FEMA may acquire damaged properties, demolish existing structures, and place deed restrictions to limit future uses to open space in perpetuity.

Developing Demonstration Projects

Demonstration projects focus on public education and are designed to highlight procedures the public can use to reduce property damage during flood, earthquake, wildfire, wind, and rainstorm disasters. Demonstration projects may involve the development of a model facility to demonstrate how hazard mitigation technologies can be used to reduce potential damage during a disaster. Flood demonstration projects may involve items such as elevating a structure or waterproofing windows and doors that are below the base flood elevation. A fire demonstration project may include vegetation management around a facility and replacing roofs, doors, and windows with fire-resistant materials. Wind and earthquake demonstration projects may include changes to the structural design of buildings to allow them to withstand higher wind velocity or more movement during an earthquake.

Actions Involving Watercourses and Coastal Features

Many FEMA funded activities pertain to inland water sources, such as streams, rivers, lakes, and coastal features such as harbors and beaches. Inland water sources may be perennial or dry during the summer months. During construction, avoidance and minimization measures typically will be used and incorporated as part of the action. Work in a stream channel often includes temporary diversion of the channel using sandbags or a cofferdam constructed of fill. Heavy equipment typically is operated from an adjacent road, bank, or other feature; however, in some cases, operating equipment in a channel area once flow has been diverted may be necessary. A pipe or a temporary secondary channel may be used to convey the diverted water.

If the action involves channel modifications, changes to the capacity of bridges and culverts, or the installation of attenuation structures, conducting hydraulic/hydrologic analyses to evaluate the changes of upstream and downstream flow rates and determine whether additional action components need to be added to address any changes in hydraulics and hydrology outside the project area may be necessary.

Relevant categories of activities include the following:

- Repairing, stabilizing, or armoring embankments;
- Creating, widening, clearing, or dredging a waterway;
- Constructing or modifying a water crossing;
- Constructing or modifying a water detention, retention, storage, or conveyance facility;
- Constructing or modifying other flood control structures; and
- Constructing or modifying a coastal feature.

Repairing, Stabilizing or Armoring Embankments

Repairing, stabilizing, or armoring embankments involves the repair of earthen or rock embankments damaged by floodwaters. Examples are natural stream banks; road, trail, and rail line embankments; embankments for irrigation and navigation canals; and levees used for flood control and reclamation. In addition to repair of damaged features, FEMA may fund measures designed to prevent damage in future flood events.

In addition to replacing fill material, embankments may be stabilized or armored through:

- Placing of rock riprap;
- Hardening with concrete or soil cement;
- Installing retaining walls, gabions, or geotextile fabrics; and/or
- Using bioengineering techniques, such as planting vegetation, placing root wads, or placing willow bundles.

A combination of these techniques may be employed. For example, rock and geotextiles, when used with root wads and willow bundles, may provide mitigation from erosion while enhancing the natural values of a stream corridor.

Creating, Widening, Clearing or Dredging a Waterway

Creating, widening, clearing, or dredging a waterway may be used to reduce the flood hazard to adjacent lands, facilities, or populated areas. New channels may be constructed to convey excess flows around flood-prone areas during flood events. Drainage swales, earthen channels, concrete channels, or subsurface concrete pipes also may be used as a means of conveyance. A new channel may be constructed in a dry environment and connected to a stream after completion. This channel may have an inlet weir higher than the elevation of the normal flow so that the normal flows remain in the natural channel. The outlet may be armored with concrete or rock riprap to prevent excessive erosion of the existing channel.

Existing channels may be widened to allow a channel to convey a larger volume of water. Conveyance may also be increased by replacing earthen banks or channel bottoms with concrete. To the extent possible, construction will be conducted from the top of the bank, but many activities may require construction equipment to work in the stream channel. In perennially flowing streams, work in a stream channel generally will be restricted to the low-flow period, and the flow will be diverted around the construction area. A pipe or a temporary secondary channel will be used to convey the diverted water.

As an alternative to constructing a bypass or modifying an existing channel, the existing channel may be cleared of vegetation or sediment to increase conveyance. This action often will be used in developed areas where modifications are not feasible, as well as in areas where years of inadequate maintenance have allowed trees and brush to grow within the channel or sediment and debris to accumulate in the channel or around culverts and bridges. Vegetation may be removed through mechanical means, by hand, or by application of herbicides. Vegetation may be removed not only from the channel but also from the banks and high-water areas, thus reducing the risk that floating debris could be trapped by trees or heavy brush. Sediment and debris may be removed by dredging, through use of heavy equipment, or by hand. All removed debris will be disposed of at approved and licensed disposal sites, in compliance with applicable laws and regulations. Woody debris and vegetation can be recycled if recycling facilities exist.

Constructing or Modifying Water Crossings

FEMA may fund the repair or replacement of damaged water crossings, the enlargement of openings to allow greater conveyance and reduce the risk that debris may be trapped during floods, or the installation of bank protection or other means to reduce the risk of erosion. Crossings may be relocated or improved to avoid high-hazard areas, repetitive damage, or areas where reconstruction is not cost-effective or feasible.

Culverts may consist of corrugated metal pipes, reinforced concrete pipes, or reinforced concrete box culverts. The capacity of a culvert crossing may be increased to reduce the risk of flooding to the surrounding area, or the culvert may be modified to prevent overtopping or erosion of the crossing. Typical measures include:

- Increasing the size of a culvert or adding culvert barrels;
- Replacing or changing the type of culvert;
- Changing the location or alignment of a culvert; and
- Adding features, such as a headwall, discharge apron, or riprap to reduce the risk of erosion or damage to a culvert or the crossing.

Similarly, bridges may be modified to increase capacity to reduce the risk of flooding or to reduce the risk of damage to the crossing. Typical activities include:

- Widening existing openings or constructing new openings;
- Reconfiguring bracing to reduce the risk that debris will be trapped;
- Installing protective features, such as concrete abutments or riprap, to reduce the risk of damage due to erosion and scour; and
- Replacing a multi-span structure with a clear-span structure.

A bridge may be installed to replace a culvert to increase the flow capacity of a crossing. Low-water crossings may be installed or improved as an alternative to repairing or replacing a culvert or bridge. Constructing or upgrading a low-water crossing typically involves hardening the banks and bottom of a water body. A temporary diversion may be necessary during construction activities.

Constructing and Water Detention, Retention, Storage or Conveyance Facility

Constructing a water detention, retention, storage, or conveyance facility may include the construction, enlargement, or restoration of detention basins, retention basins, sediment ponds, reservoirs, or conveyance facilities, such as irrigation ditches or flumes, to reduce flood flows or to provide a water source for fighting fires in an area of high fire hazard. The creation and/or enlargement of water storage reservoirs is most frequently associated with flood disasters and to a lesser extent, fire disasters.

Detention basins, retention basins, sediment ponds, and reservoirs will be constructed to temporarily store floodwater to reduce downstream peak flows. The stored water will be released at a slower rate so that the existing drainage-ways can convey water without contributing to downstream flooding. All areas disturbed during the construction of these features will be revegetated with native plant species. This action also will include the repair or restoration of water retention or conveyance structures. All sediment removed from these features will be disposed of in a manner consistent with Federal, State, and local laws and regulations.

In rural areas, firefighting may be constrained by the lack of water readily accessible to firefighters. In response to this need, proposed activities also may include the creation of retention facilities in locations that firefighters can readily access, either as a direct source of water or as a source of water to fill water supply trucks. All areas disturbed during the construction of a retention facility will be revegetated with native plant species.

Constructing Other Flood-Control Structures

A flood-control structure is a facility designed to prevent floodwaters from entering a flood-prone area. Typical examples are levees (also referred to as dikes) and floodwalls. Activities include:

- Repairing damaged facilities, usually during emergency situations;
- Installing embankment protection;
- Raising the height of existing facilities to prevent overtopping in future floods;
- Constructing new facilities to protect flood-prone areas from damage during future floods; and
- Modifying or installing interior drainage systems to reduce the risk of damage behind levees and floodwalls during heavy rains or flooding events on tributary streams.

Levees will be repaired or constructed using compacted fill and, in some cases, riprap protection. Bare earth will be seeded with grasses to prevent erosion. Typically, a gravel road will be installed on the levee's crest to allow for maintenance. Floodwalls, typically built in urban areas, will be constructed using reinforced concrete or grouted, reinforced concrete block. Excavation will be necessary to install footings. Levees and floodwalls both will have interior drainage systems that may include pumps for removing accumulated water.

Constructing a Coastal Feature

Constructing a coastal feature may involve the repair, replacement, or construction of facilities in coastal environments, such as estuaries, inlets, harbors, and beaches. These facilities include:

- Recreational facilities, such as piers and boat ramps;
- Facilities for maritime use, such as docks and slips;
- Shoreline protection devices, such as seawalls, groins, jetties, and revetments; and
- Coastal flood-control structures, such as levees.

Construction activities are expected to occur in water and involve driving piles, placing rock or soil, or dredging sand, mud, or other sediment.

Wildfire Risk Reduction

Vegetation management is intended to reduce the risk of loss and damage due to wildfire and, as described above under "Actions Involving Watercourses and Coastal Features", increase the ability of channels to convey flows, thus reducing the risk of flood damage. Vegetation management for wildfire risk reduction may be accomplished using mechanical means, hand-clearing, application of herbicides, or grazing. Some activities may include a combination of these methods. During implementation, avoidance and minimization measures will be used and incorporated as part of the action.

Relevant categories of activities are:

- Mechanical or hand clearing of vegetation;
- Herbicidal treatments; and
- Biological control.

Mechanical or Hand Clearing of Vegetation

Mechanical or hand clearing of vegetation will be used for the selective removal of vegetation so that a certain proportion of vegetation is left in place. This is done to reduce the amount of vegetative fuels in an area where mechanical removal of vegetation is impractical or the remaining vegetation needs to be protected. Per FEMA's Wildfire Mitigation Policy vegetation may be removed to create defensible space around buildings and structures, and to protect life and property beyond defensible space perimeters but proximate to (less than 2 miles from) at-risk structures. The creation and maintenance of firebreaks, access roads, and staging areas are not eligible for FEMA funding.

In mechanical removal, heavy equipment will be used to uproot, crush, pulverize, or cut the trees and brush being removed. Hand removal will involve the use of chainsaws, axes, and hoes to cut and uproot vegetation. Depending on the location of the vegetation removal project and State and local regulations, vegetation downed as a result of mechanical or hand removal will be piled and burned onsite, chipped and spread onsite, or loaded and hauled away from the site. After the removal of the targeted vegetation, cleared areas may be revegetated with native, fire-resistant species. Vegetation hauled offsite can be recycled but must be disposed of in accordance with appropriate requirements.

Herbicidal Treatments

Activities generally associated with herbicidal treatment include the removal of targeted exotic invasive species within specific areas and the prevention of growth and re-sprouting of undesirable vegetation once an area has been cleared of excessive vegetation by mechanical removal and/or hand removal. Only U.S. Environmental Protection Agency-approved herbicides will be used to control the growth of undesired vegetation in a manner consistent with labeling instructions and applicable Federal and State regulations. After treatment, some areas may be revegetated with native vegetation that is fire resistant.

Biological Control

In biological control, cattle, horses, goats, sheep, or other livestock are allowed to graze on grasses and other vegetation as a means of control. Any area proposed for grazing will be fenced. The type of animals, timing, duration, and stocking rate will be selected based on the targets of the vegetation management plan (i.e., the quantity and quality of residue to remain).

Proposed General Avoidance and Minimization Measures and Species-Specific Conservation Measures

General Avoidance and Minimization Measures

The general avoidance and minimization measures described in this section will be implemented, as appropriate, to reduce the identified potential adverse effects from a Subapplicant's proposed

project. The Subapplicant will be responsible for implementation of the avoidance and minimization measures that FEMA identifies as necessary for the proposed project.

GEN AMM-1 Erosion and Sedimentation Prevention Measures: The Subapplicant will prepare an Erosion Control Plan, as needed. The Erosion Control Plan will detail the erosion and sedimentation prevention measures required. As part of this plan, the Subapplicant will ensure that sediment-control devices are installed and maintained correctly. For example, sediment will be removed from engineering controls once the sediment has reached one-third of the exposed height of the control. The devices will be inspected frequently (i.e., daily or weekly, as necessary) to ensure that they are functioning properly; controls will be immediately repaired or replaced or additional controls will be installed as necessary. Sediment that is captured in these controls may be disposed of onsite in an appropriate, safe, approved area or offsite at an approved disposal site.

Areas of soil disturbance, including temporarily disturbed areas, will be seeded with a regionally appropriate erosion control seed mixture. On soil slopes with an angle greater than 30 percent, erosion control blankets will be installed or a suitable and approved binding agent will be applied. Runoff will be diverted away from steep or denuded slopes.

Where habitat for covered species is identified within, or adjacent to, the project footprint, all disturbed soils at the site will undergo erosion control treatment before the rainy season starts and after construction is terminated. Treatment may include temporary seeding and sterile straw mulch.

GEN AMM-2 Bank Stabilization: If bank stabilization activities are necessary, then such stabilization will be constructed to minimize erosion potential, and will contain design elements suitable for supporting riparian vegetation, if feasible.

GEN AMM-3 Dust Control Measures: To reduce dust, all traffic associated with the Subapplicant's construction activities will be restricted to a speed limit of 15 miles per hour when traveling off of highways or county roads.

Stockpiles of material that are susceptible to wind-blown dispersal will be covered with plastic sheeting or other suitable material to prevent movement of the material.

During construction, water or other binding materials will be applied to disturbed ground that may become windborne. If binding agents are used, all manufacturers' recommendations for use will be followed.

GEN AMM-4 Spill Control Planning: The Subapplicant will prepare a Spill Prevention and Pollution Control Plan to address the storage of hazardous materials and emergency cleanup of any hazardous material and will be available onsite, if applicable. The plan will incorporate hazardous waste, storm water, and other emergency planning requirements.

GEN AMM-5 Spill Prevention and Pollution Control Measures: The Subapplicant will exercise every reasonable precaution to protect covered species and their habitats from pollution due to fuels, oils, lubricants, construction by-products, and pollutants such as construction chemicals, fresh cement, saw-water, or other harmful materials. Water containing mud, silt, concrete, or other by-products or pollutants from construction activities will be treated by filtration, retention in a settling pond, or similar measures. Fresh cement or concrete will not be allowed to enter the flowing water of streams and curing concrete will not come into direct contact with waters supporting covered

species. Construction pollutants will be collected and transported to an authorized disposal area, as appropriate, per all Federal, State, and local laws and regulations.

To reduce bottom substrate disturbance and excessive turbidity, removal of existing piles by cutting at the substrate surface or reverse pile driving with a sand collar at the base to minimize resuspension of any toxic substances is preferable; hydraulic jetting will not be used.

No petroleum product chemicals, silt, fine soils, or any substance or material deleterious to covered species will be allowed to pass into or be placed where it can pass into a stream channel. There will be no side-casting of material into any waterway.

All concrete or other similar rubble will be free of trash and reinforcement steel. No petroleum-based products (e.g., asphalt) will be used as a stabilizing material.

The Subapplicant will store all hazardous materials in properly designated containers in a storage area with an impermeable membrane between the ground and the hazardous materials. The storage area will be encircled by a berm to prevent the discharge of pollutants to ground water or runoff into the habitats of covered species. A plan for the emergency cleanup of any hazardous material will be available onsite, and adequate materials for spill cleanup will be maintained onsite.

GEN AMM-6 Equipment Inspection and Maintenance: Well-maintained equipment will be used to perform the work and, except in the case of a failure or breakdown, equipment maintenance will be performed offsite. Equipment will be inspected daily by the operator for leaks or spills. If leaks or spills are encountered, the source of the leak will be identified, leaked material will be cleaned up, and the cleaning materials will be collected and properly disposed. Fueling of land- and marine-based equipment will be conducted in accordance with procedures to be developed in the Spill Prevention and Pollution Control Plan.

Vehicles and equipment that are used during the course of a project will be fueled and serviced in a "safe" area (i.e., outside of sensitive habitats) in a manner that will not affect covered species or their habitats. Spills, leaks, and other problems of a similar nature will be resolved immediately to prevent unnecessary effects on covered species and their habitats. A plan for the emergency cleanup of any spills of fuel or other material will be available onsite, and adequate materials for spill cleanup will be maintained onsite.

GEN AMM-7 Fueling Activities: Avoidance and minimization measures will be applied to protect covered species and their habitats from pollution due to fuels, oils, lubricants, and other harmful materials. Vehicles and equipment that are used during project implementation will be fueled and serviced in a manner that will not affect covered species or their habitats. Machinery and equipment used during work will be serviced, fueled, and maintained on uplands to prevent contamination to surface waters. Fueling equipment and vehicles will be kept more than 200 feet away from waters of the United States. Exceptions to this distance requirement may be allowed for large cranes, pile drivers, and drill rigs if they cannot be easily moved.

GEN AMM-8 Equipment Staging: No staging of construction materials, equipment, tools, buildings, trailers, or restroom facilities will occur in a floodplain during flood season at the proposed project location, even if staging is only temporary.

GEN AMM-9 Materials Storage and Disposal: Stockpiled soils will be adequately covered to prevent sedimentation from runoff and wind. All hazardous materials will be stored in upland areas

in storage trailers and/or shipping containers designed to provide adequate containment. Short-term laydown of hazardous materials for immediate use will be permitted provided the same containment precautions are taken as described for hazardous materials storage. All construction materials, wastes, debris, sediment, rubbish, trash, and fencing will be removed from the site once project construction is complete and transported to an authorized disposal area, as appropriate, in compliance with applicable Federal, State, and local laws and regulations. No disposal of construction materials or debris will occur in a floodplain. No storage of construction materials or debris will occur in a floodplain during flood season.

GEN AMM-10 Fire Prevention: With the exception of vegetation-clearing equipment, no vehicles or construction equipment will be operated in areas of tall, dry vegetation.

The Subapplicant will develop and implement a fire prevention and suppression plan for all maintenance and repair activities that require welding or otherwise have a risk of starting a wildfire.

GEN AMM-11 Waste Management: The work area will be kept free of loose trash, including small pieces of residual construction material, such as metal cuttings, broken glass, and hardware.

All food waste will be removed from the site on a daily basis.

All construction material, wastes, debris, sediment, rubbish, vegetation, trash, and fencing will be removed from the site once the project is completed and will be transported to an authorized disposal area, as appropriate, per all Federal, State, and local laws and regulations.

GEN AMM-12 Work Involving Boats and Barges: For projects that involve in-water work for which boats and/or temporary floating work platforms are necessary, buoys will be installed so moored vessels will not beach on the shoreline, anchor lines will not drag, and moored vessels and buoys are not located within 25 feet of vegetated shallow waters. Temporary floating work platforms will not anchor or ground in fish spawning areas in freshwater or in eelgrass, kelp, or macro algae. To reduce the likelihood of introducing aquatic invasive species, vessels will use the State's Marine Invasive Species Program. Drip pans and other spill control measures will be used so that oil or fuel from barge-mounted equipment is properly contained.

GEN AMM-13 Work Area Designation to Minimize Disturbance: The Subapplicant will reduce, to the maximum extent practicable, the amount of disturbance at a site to the absolute minimum necessary to accomplish the project. Wherever possible, existing vegetation will be salvaged from the project area and stored for replanting after earthmoving activities are completed. Topsoil will be removed, stockpiled, covered, and encircled with silt fencing to prevent loss or movement of the soil into covered species habitats. All topsoil will be replaced in a manner to recreate pre-disturbance conditions as closely as possible.

Project planning must consider not only the effects of the action itself, but also all ancillary activities associated with the actions, such as equipment staging and refueling areas, topsoil or spoils stockpiling areas, material storage areas, disposal sites, routes of ingress and egress to the project site, and all other related activities necessary to complete the project.

GEN AMM-14 Access Routes and Staging Areas: When working on stream banks or floodplains, disturbance to existing grades and vegetation will be limited to the actual site of the project and necessary access routes. Placement of all roads, staging areas, and other facilities will avoid and limit disturbance to sensitive habitats (e.g., stream banks, stream channel, and riparian

habitat) as much as possible. When possible, existing ingress or egress points will be used and/or work will be performed from the top of the stream banks. After completion of the work, the contours of the streambed, vegetation, and stream flows will be returned to their pre-construction condition or better.

All staging and material storage areas, including the locations where equipment and vehicles are parked overnight, will be placed outside of the flood zone of a watercourse, above areas of tidal inundation, away from riparian habitat or wetland habitat, and away from any other sensitive habitats. When possible, staging and access areas will be situated in areas that are previously disturbed, such as developed areas, paved areas, parking lots, areas with bare ground or gravel, and areas clear of vegetation.

GEN AMM-15 Environmental Awareness Training for Construction Personnel: All construction personnel will be given environmental awareness training by the project's environmental inspector or biological monitor before the start of construction. The training will familiarize all construction personnel with the covered species that may occur onsite, their habitats, general provisions and protections afforded by the Act, measures to be implemented to protect these species, and the project boundaries. This training will be provided within three days of the arrival of any new worker.

As part of the environmental awareness training, construction personnel will be notified that no dogs or any other pets under control of construction personnel will be allowed in the construction area, and that no firearms will be permitted in the construction area, unless carried by authorized security personnel or law enforcement.

GEN AMM-16 Biological Monitor: If a project involves activities that may result in take of a covered species, as defined by the Act, a Service-approved biologist will be present onsite for all construction activities that occur within 100 feet of habitat for those species. If a Service-approved biologist is needed, the Subapplicant will submit the biologist's qualifications to the Service for approval 30 days prior to project construction. The Service-approved biologist will ensure that all applicable avoidance and minimization measures in the programmatic biological opinion are implemented during project construction. The Service-approved biologist will also ensure that all vehicles entering the site are free of debris that may harbor organisms that could be introduced to the site, such as vegetation or mud from other aquatic areas. The Service-approved biologist will also ensure that turbidity, sedimentation, and the release of materials such as dust or construction runoff are controlled, and that spill control measures are enacted properly.

The Service-approved biologist will oversee construction activities to ensure that no covered species and/or their habitats are adversely affected. The Service-approved biologist will have the authority to stop any work activities that may result in potential adverse effects to covered species and/or their habitats.

Approval requests from the Subapplicants for Service-approved biologists shall include, at a minimum:

a. Relevant education;
b. Relevant training concerning the listed species for which approval is requested, including species identification, survey techniques, handling individuals of different age classes, and handling of different life stages by a permitted biologist or recognized species expert authorized by the Service for such activities;

c. A summary of field experience conducting requested activities (to include project/research information);
d. A summary of biological opinions under which they were authorized to work with the requested species and at what level (such as construction monitoring versus handling), this will also include the names and qualification of persons under which the work was supervised as well as the amount of work experience on the actual project;
e. A list of Federal Recovery Permits [10(a)1(A)] held or under which they are authorized to work with the species requested (to include the permit number, authorized activities and name of permit holder); and
f. Any relevant professional references with contact information.

GEN AMM-17 Daily Work Hours: Construction activities that may affect suitable habitat for covered species will be limited to daylight hours during weekdays, leaving a nighttime and weekend period for the species. Work will be allowed on weekends if the proposed construction is 14 days or less in length.

GEN AMM-18 Entrapment Prevention: To prevent entrapment of covered species, all vertically sided holes or trenches will be covered at the end of the workday, or have escape ramps built into the walls of the excavation. If pipes are stored onsite or in associated staging areas, they will be capped when not in use.

Construction materials that have the potential to entangle or entrap wildlife will be properly contained so that wildlife cannot interact with the materials.

If a covered species is identified onsite, crews will immediately stop work within 50 feet of the individual, and inform the construction supervisor and the Service-approved biologist. Work will not continue within 50 feet of the individual until it has traveled off the project site of its own volition. For covered species, please refer to the species-specific Conservation Measures section of the programmatic biological opinion.

GEN AMM-19 Water Quality Protection: Contractors will exercise every reasonable precaution to protect covered species and their critical habitats from construction byproducts and pollutants, such as construction chemicals, fresh cement, saw-water, or other deleterious materials. Fresh cement or uncured concrete will not be allowed to come into contact with any waterway. Construction waste will be collected and transported to an authorized upland disposal area, as appropriate, and per Federal, State, and local laws and regulations.

The Subapplicant will follow the best management practices described in *The Use of Treated Wood Products in Aquatic Environments* guidelines (NOAA Fisheries 2009). Although this guidance focuses on the effects of the contaminants on Pacific salmonids protected under the Act, this guidance may still apply for general water quality protection and other federally-protected species. This guidance will be used in conjunction with site-specific evaluations of other potential impacts. Riprap will be clean and durable, free from dirt, sand, clay, and rock fines and will be installed to withstand the 100-year flood event. If applicable, appropriate measures will be taken to minimize disturbance to potentially contaminated sediments.

GEN AMM-20 Revegetation of Stream Banks: For projects that require revegetation of stream and riverbanks as a result of riparian vegetation removal during construction activities, the Subapplicant will implement revegetation techniques. Where such revegetation is needed, the Subapplicant will prepare and implement a revegetation plan that includes information regarding

monitoring for success. Revegetation plantings will be replaced at a 3:1 ratio with an 80 percent planting survival within 5 years of the plantings.

GEN AMM-21 Restoration of Upland Areas to Pre-Project Conditions: For projects that require restoration of upland areas to pre-project conditions as a result of ground disturbance during construction activities, the Subapplicant will use native plants to the maximum extent practicable. Similarly, when hydroseeding, only native seed mix will be used.

GEN AMM-22 Invasive Aquatic Species: The Subapplicant will follow the guidelines in the California Department of Fish and Wildlife's (CDFW's) *California Aquatic Invasive Species Management Plan* to prevent the spread of invasive aquatic plant and animal species (CDFW 2008).

Construction equipment will be clean of debris or material that may harbor seeds or invasive pests before entering the work area. This debris or material includes dirt on construction equipment, tools, boots, pieces of vegetation, and water in the bilge of boats. All aquatic sampling equipment will be sterilized using appropriate guidelines before its use in aquatic habitats.

GEN AMM-23 Work below Mean Higher High Water: In freshwater, estuarine, and marine areas that support covered species, disturbance to habitat below mean higher high water will be limited to the maximum extent possible.

GEN AMM-24 Avoidance of Submerged Vegetation: The removal of submerged vegetation (such as eelgrass and kelp estuarine or marine areas, or submerged aquatic vegetation in freshwater areas) will be avoided to the maximum extent possible.

GEN AMM-25 Minimization of Shading by Overwater Structures: To reduce shading effects, new and replacement structures placed over freshwater, estuarine, and marine waters (such as bridges, piers, floating docks, and gangways) will incorporate design elements (such as metal grating or glass paver blocks) that allow light transmission when feasible.

GEN AMM-26 Water Diversion and Dewatering: In-channel work and channel diversion of live flow during project construction will be conducted in a manner to reduce impacts to covered species. Dewatering will be used to create a dry work area and will be conducted in a manner that minimizes turbidity into nearby waters. Water diversion and dewatering will include the following measures:

a. Heavy equipment will avoid flowing water other than temporary crossing or diverting activities.
b. If covered species may be present in the areas to be dewatered, relocation will be conducted by a Service-approved biologist in accordance with applicable Service species-specific Conservation Measures. Because this measure involves take of a species, it is only applicable to covered species for which an Incidental Take Statement is provided.
c. Water pumped or removed from dewatered areas will be treated before its release so that it does not contribute to turbidity in nearby waters.
d. Temporary culverts to convey live flow during construction activities will be placed at stream grade and be of an adequate size as to not increase stream velocity.
e. Silt fences or mechanisms to avoid sediment input to the flowing channel will be erected adjacent to flowing water if sediment input to the stream may occur.

Species-Specific Conservation Measures

In cases where the species-specific Conservation Measures are duplicative of the General Avoidance and Minimization Measures, the most comprehensive measure (i.e., the measure providing the most restriction) will apply.

California Red-Legged Frog California Tiger Salamander; Central California DPS, California Tiger Salamander, Sonoma DPS

To reduce potential effects to the California red-legged frog and Sonoma and Central California tiger salamander Distinct Population Segments (DPSs) (California tiger salamander), the following measures to avoid and minimize adverse effects to the California red-legged frog and California tiger salamander and their critical habitat will be incorporated into the proposed project. These measures will be communicated to the contractor through the use of special provisions included in the contract bid solicitation package.

CRLF-CTS-1 Biological Monitor: A SFWO-approved biologist(s) will be onsite during all activities that may result in take of California red-legged frogs or California tiger salamanders.

CRLF-CTS-2 Seasonal Avoidance: Project activities will be scheduled to minimize adverse effects to the California red-legged frog and California tiger salamander and their habitat. Disturbance to upland habitat will be confined to the dry season, generally May 1 through October 15 (or the first measurable fall rain of 1" or greater) because that is the time period when California red-legged frogs and California tiger salamanders are less likely to be moving through upland areas. However, if unavoidable, conduct grading and other disturbance in pools and ponds only when they are dry, typically between July 15 and October 15. Work within a pool or wetland may begin prior to July 15 if the pool or wetland has been dry for a minimum of 30 days prior to initiating work.

CRLF-CTS-3 Rain Event Limitations: To the maximum extent practicable, no construction activities will occur during rain events or within 24 hours following a rain event. Prior to construction activities resuming, a SFWO-approved biologist will inspect the Action Area and all equipment/materials for the presence of California red-legged frogs and California tiger salamanders. Construction may continue 24 hours after the rain ceases if no precipitation is forecasted within 24-hours. If rain exceeds 0.5 inches during a 24-hour period, work will cease until no further rain is forecasted. The Service may approve modifications to this timing on a case-by-case basis.

CRLF-CTS-4 Pre-construction Survey: No more than 24 hours prior to the date of initial ground disturbance and vegetation clearing, a SFWO-approved biologist with experience in the identification of all life stages of the California red-legged frog and California tiger salamander and designated critical habitat will conduct a pre-construction survey at the project site. The survey will consist of walking the project limits and within the project site to determine possible presence of the species. The SFWO-approved biologist will investigate all areas that could be used by California red-legged frogs and California tiger salamanders for feeding, breeding, sheltering, movement, and other essential behaviors, such as small woody debris, refuse, burrows entries, etc.

CRLF-CTS-5 Daily Clearance Surveys: The SFWO-approved biologist will conduct clearance surveys at the beginning of each day and regularly throughout the workday when construction activities are occurring that may result in take of California red-legged frogs and California tiger salamanders.

CRLF-CTS-6 Environmentally Sensitive Areas: Prior to the start of construction, Environmentally Sensitive Areas (ESAs) – defined as areas containing sensitive habitats adjacent to or within construction work areas for which physical disturbance is not allowed – will be clearly delineated using high visibility orange fencing. The ESA fencing will remain in place throughout the duration of the proposed action, while construction activities are ongoing, and will be regularly inspected and fully maintained at all times. The final project plans will depict all locations where ESA fencing will be installed and will provide installation specifications. The bid solicitation package special provisions will clearly describe acceptable fencing material and prohibited construction-related activities including vehicle operation, material and equipment storage, access roads and other surface-disturbing activities within ESAs. With prior approval from the Service, a hybrid ESA/WEF fencing material that is both hi-visibility and impermeable to wildlife movement may be used in place of paired ESA fencing and WEF fencing. Also with prior approval from the Service, an exception to the foregoing fencing measures may apply on a case-by-case basis during the following situations: (1) at work sites where the duration of work activities is very short (e.g., 3 days or less), the work activities occur during the dry season, and the installation of ESA fencing will result in more ground disturbance than from project activities; or (2) at work sites where the substrate (i.e., rock, shale, etc.) or topography (i.e., slopes > 30 degrees) inhibit the safe and proper installation of fencing materials. In these cases, biological monitoring will occur during all project activities at that site.

CRLF-CTS-7 Wildlife Exclusion Fencing: Prior to the start of construction, Wildlife Exclusion Fencing (WEF) will be installed at the edge of the project footprint in all areas where California red-legged frogs and California tiger salamanders could enter the construction area. The onsite Project Manager and the SFWO-approved biologist will determine location of the fencing prior to the start of staging or surface disturbing activities.

a. Exclusion fencing will be at least 3 feet high and the lower 6 inches of the fence will be buried in the ground to prevent animals from crawling under. The remaining 2.5 feet will be left above ground to serve as a barrier for animals moving on the ground surface.
b. Such fencing will be inspected and maintained daily by the SFWO-approved biologist until completion of the project and removed only when all construction equipment is removed from the site.
c. The WEF specifications will be included the final project plans and in the bid solicitation package (special provisions) and will include the WEF specifications including installation and maintenance criteria.
d. The WEF will remain in place throughout the duration of the project and will be regularly inspected and fully maintained. Repairs to the WEF will be made within 24 hours of discovery.
e. Upon project completion the WEF will be completely removed, the area cleared of debris and trash, and returned to natural conditions.
f. With prior approval from the Service, an exception to the foregoing fencing measures may apply on a case-by-case basis during the following situations: 1) at work sites where the duration of work activities are very short (e.g., 3 days or less), the work activities occur during the dry season, and the installation of exclusion fencing will result in more ground disturbance than from project activities; or (2) at work sites where the substrate (i.e., rock, shale, etc.) or topography (i.e., slopes > 30 degrees) inhibit the safe and proper installation of fencing materials. In these cases, species monitoring will occur during all project activities at that site. Modifications to this fencing measure may be made on a case-by-case basis with approval from the Service.

g. With prior approval from the Service, a hybrid ESA/WEF fencing material that is both hi-visibility and impermeable to wildlife movement may be used in place of paired ESA fencing and WEF fencing.

CRLF-CTS-8 Entrapment Prevention: To prevent inadvertent entrapment of animals during construction, all excavated, steep-walled holes or trenches more than 6 inches deep will be covered with plywood or similar materials at the close of each working day or provided with one or more escape ramps constructed of earth fill or wooden planks. The SFWO-approved biologist will inspect all holes and trenches at the beginning of each workday and before such holes or trenches are filled. All replacement pipes, culverts, or similar structures stored in the Action Area overnight will be inspected before they are subsequently moved, capped, and/or buried. If at any time a California red-legged frog or California tiger salamander is discovered, the onsite Project Manager and SFWO-approved biologist will be notified immediately and the SFWO-approved biologist will implement the species observation and handling protocol. If handling is necessary, work will be suspended until the appropriate level of coordination is complete.

CRLF-CTS-9 Encounters with Species: Each encounter with a California red-legged frog or California tiger salamander will be treated on a case-by-case basis. If any life stage of the California red-legged frog or California tiger salamander is found and these individuals may be killed or injured by work activities, the following will apply:

a. If California red-legged frogs or California tiger salamanders are detected in the Action Area, work activities within 50 feet of the individual that may result in the harm, injury, or death to the animal will cease immediately and the onsite Project Manager and SFWO-approved biologist will be notified. Based on the professional judgment of the SFWO-approved biologist, if project activities can be conducted without harming or injuring the California red-legged frog and California tiger salamander, it may be left at the location of discovery and monitored by the SFWO-approved biologist. All project personnel will be notified of the finding and at no time will work occur within 50 feet of a California red-legged frog and California tiger salamander without a SFWO-approved biologist present.
b. To the maximum extent possible, contact with the individual frog or salamander will be avoided and it will be allowed to move out of the hazardous situation of its own volition. This procedure applies to situations where a California red-legged frog and California tiger salamander is encountered while it is moving to another location. It does not apply to animals that are uncovered or otherwise exposed or in areas where there is not sufficient adjacent habitat to support the species if the individual moves away from the hazardous location.

CRLF-CTS-10 Species Observations and Handling Protocol: If a California red-legged frog or California tiger salamander does not leave the work area, the SFWO-approved biologist will implement the species observation and handling protocol outlined below. Only SFWO-approved biologists will participate in activities associated with the capture, handling, relocation, and monitoring of California red-legged frogs and California tiger salamanders.

a. Prior to handling and relocation, the SFWO-approved biologist will take precautions to prevent 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 (Service 2003c). Disinfecting equipment and clothing is especially important when biologists are coming to the Action Area to handle amphibians after working in other aquatic habitats. California red-legged frogs and the Sonoma and

Central California tiger salamanders will also be handled and assessed according to the Restraint and Handling of Live Amphibians (USGS National Wildlife Health Center 2001).

b. California red-legged frogs and California tiger salamanders will be captured by hand, dip net, or other SFWO-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. Individuals will be relocated no greater than 300 feet outside of the project site to areas with an active rodent burrow or burrow system (unless otherwise approved by the Service and with written landowner permission). Holding/transporting containers and dip nets will be thoroughly cleaned, disinfected, and rinsed with freshwater prior to use within the Action Area. The Service will be notified within 24 hours of all capture, handling, and relocation efforts.
c. If an injured California red-legged frog or California tiger salamander is encountered and the SFWO-approved biologist determines the injury is minor or healing and the salamander is likely to survive, the salamander will be released immediately, consistent with measure 12.b above. The California red-legged frogs and the Sonoma and Central California tiger salamander will be monitored until it is determined that it is not imperiled by predators or other dangers.
d. If the SFWO-approved biologist determines that a California red-legged frog or California tiger salamander has major or serious injuries as a result of project-related activities the SFWO-approved biologist, or designee, will immediately take it to a SFWO-approved facility. 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 the Service. The Subapplicant will bear any costs associated with the care or treatment of such injured California red-legged frogs or California tiger salamanders. 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 the Service as described below.
e. Notification to the Service of an injured or dead California red-legged frog or California tiger salamander in the Action Area will be made and reported whether or not its condition resulted from project-related activities. In addition, the SFWO-approved biologist will follow up with the Service in writing within 2 calendar days of the finding. Written notification to the Service will include the following information: the species, number of animals taken or injured, sex (if known), date, time, 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 the Service regarding the disposition of the specimen.

CRLF-CTS-11 Environmental Awareness Training: Prior to the start of construction, a SFWO-approved biologist with experience in the ecology of the California red-legged frog and California tiger salamander as well as the identification of all its life stages will conduct a training program for all construction personnel including contractors and subcontractors. Interpretation for non-English speaking workers will be provided. All construction personnel will be provided a fact sheet conveying this information. The same instruction will be provided to any new workers before they are authorized to perform project work. The training will include, at a minimum:

a. habitat within the Action Area;
b. an explanation of the species status and protection under state and federal laws;

c. the avoidance and minimization measures to be implemented to reduce take of this species;
d. communication and work stoppage procedures in case a listed species is observed within the Action Area; and
e. an explanation of the importance of the Environmentally Sensitive Areas (ESAs) and Wildlife Exclusion Fencing (WEF).

CRLF-CTS-12 Disease Prevention and Decontamination Procedures: To ensure that diseases are not conveyed between work sites by the SFWO-approved biologist, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times. A copy of the code of practice is enclosed.

CRLF-CTS-13 Pump Screens: If a water body is to be temporarily dewatered by pumping, intakes will be completely screened with wire mesh not larger than 5 millimeters and the intake will be placed within a perforated bucket or other method to attenuate suction to prevent California red-legged frogs and California tiger salamanders from entering the pump system. Pumped water will be managed in a manner that does not degrade water quality and upon completion be released back into the water body, or at an appropriate location in a manner that does not cause erosion. No re-watering of the water body is necessary if sufficient surface or subsurface flow exists to fill it within a few days, or if work is completed during the time of year the water body will have dried naturally. To avoid effects to eggs and larvae, work within seasonal ponds will be conducted when the pond has been dry naturally for at least 30 days

CRLF-CTS-14 Hand Clear Vegetation: Hand clear vegetation in areas where California red-legged frogs and California tiger salamanders are suspected to occur. All cleared vegetation will be removed from the project footprint to prevent attracting animals to the project site. A SFWO-approved biologist will be present during all vegetation clearing and grubbing activities. Prior to vegetation removal, the SFWO-approved biologist will thoroughly survey the area for California red-legged frogs and California tiger salamanders. Once the SFWO-approved biologist has thoroughly surveyed the area, clearing and grubbing may continue without further restrictions on equipment; however, the SFWO-approved biologist will remain onsite to monitor for California red-legged frogs and California tiger salamanders until all clearing and grubbing activities are complete.

CRLF-CTS-15 Wildlife Passage for Road Improvement: When constructing a road improvement, wherever possible, enhance or establish wildlife passage for the California red-legged frog and California tiger salamander across roads, highways, or other anthropogenic barriers. This includes upland culverts, tunnels, and other crossings designed specifically for wildlife movement, as well as making accommodations in curbs, median barriers, and other impediments to terrestrial wildlife movement at locations most likely beneficial to the California red-legged frog and California tiger salamander.

CRLF-CTS-16 Accidental Spills, SWPPP, Erosion Control, and BMPs: Prior to the onset of work, a plan will be in place for prompt and effective response to any accidental spills. All workers will be informed of the importance of preventing spills and of the appropriate measures to implement if a spill occurs. Storm-water pollution prevention plans and erosion control BMPs will be developed and implemented to minimize any wind- or water-related erosion. These provisions will be included in construction contracts for measures to protect sensitive areas and prevent and minimize storm-water and non-storm-water discharges. Protective measures will include, at a minimum:

a. No discharge of pollutants from vehicle and equipment cleaning is allowed into any storm drains or watercourses.
b. Vehicle and equipment fueling and maintenance operations must be at least 50 feet away from aquatic or riparian habitat and not in a location where a spill may drain directly toward aquatic habitat, except at established commercial gas stations or at an established vehicle maintenance facility. The monitor will implement the spill response plan to ensure contamination of aquatic or riparian habitat does not occur during such operations.
c. Concrete wastes will be collected in washouts and water from curing operations is to be collected and disposed of properly. Neither will be allowed into watercourses.
d. Spill containment kits will be maintained onsite at all times during construction operations and/or staging or fueling of equipment.
e. Dust control will be implemented, and may include the use of water trucks and non-toxic tackifiers (binding agents) to control dust in excavation and fill areas, rocking temporary access road entrances and exits, and covering of temporary stockpiles when weather conditions require.
f. Graded areas will be protected from erosion using a combination of silt fences, fiber rolls, etc. along toes of slopes or along edges of designated staging areas, and erosion control netting (such as jute or coir) as appropriate on sloped areas. No erosion control materials that use plastic or synthetic monofilament netting will be used.
g. Permanent erosion control measures such as bio-filtration strips and swales to receive storm water discharges from paved roads or other impervious surfaces will be incorporated to the maximum extent practicable.
h. All grindings and asphaltic-concrete waste will be stored within previously disturbed areas absent of habitat and at a minimum of 50 feet from any aquatic habitat, culvert, or drainage feature.

CRLF-CTS-17 Site Restrictions: The following site restrictions will be implemented to avoid or minimize effects on the listed species and its habitat:

a. A speed limit of 15 miles per hour (mph) in the project footprint in unpaved areas will be enforced to reduce dust and excessive soil disturbance.
b. Construction and ground disturbance will occur only during daytime hours, and will cease no less than 30 minutes before sunset and may not begin again earlier than 30 minutes after sunrise.
c. Except when necessary for driver or pedestrian safety, to the maximum extent practicable, artificial lighting at a project site will be prohibited during the hours of darkness.
d. Routes and boundaries of roadwork will be clearly marked prior to initiating construction or grading.
e. To the maximum extent practicable, any borrow material will be certified to be non-toxic and weed free.
f. All food and food-related trash items will be enclosed in sealed trash containers and properly disposed of offsite.
g. No pets will be allowed anywhere in the Action Area during construction.

CRLF-CTS-18 Suitable Erosion Control Materials: To prevent California red-legged frogs and California tiger salamanders from becoming entangled, trapped, or injured, erosion control materials that use plastic or synthetic monofilament netting will not be used within the Action Area. 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 movement of the California red-legged frog and California tiger salamander.

CRLF-CTS-19 Limitation on Insecticide/Herbicide Use: Insecticides or herbicides will not be applied at the project site during construction where there is the potential for these chemical agents to enter creeks, streams, waterbodies, or uplands that contain habitat for the California red-legged frog and California tiger salamander.

CRLF-CTS-20 Limitation on Rodenticide Use: No rodenticides will be used at the project site during construction or long-term operational maintenance in areas that support suitable upland habitat for the California red-legged frog and California tiger salamander.

CRLF-CTS-21 Invasive Non-Native Plant Species Prevention: The SFWO-approved biologist will ensure that the spread or introduction of invasive non-native plant species, via introduction by arriving vehicles, equipment, imported gravel, and other materials, will be avoided to the maximum extent possible. When practicable, invasive non-native plants in the Action Area will be removed and properly disposed of in a manner that will not promote their spread. Areas subject to invasive non-native weed removal or disturbance will be replanted with appropriate mix of fast-growing native species. Invasive non-native plant species include those identified in the California Invasive Plant Council's (Cal-IPC) Inventory Database, accessible at: www.cal-ipc.org/ip/inventory/index.php.

CRLF-CTS-22 Removal of Diversion and Barriers to Flow: Upon 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 to the maximum extent possible; any imported material will be removed from stream beds upon completion of the project.

CRLF-CTS-23 Removal of Non-Native Species: A SFWO-approved individual will permanently remove, from within the Action Area, any individuals of non-native species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible. The Subapplicant is responsible for ensuring that these activities are in compliance with the California Fish and Game Code. No conversion of seasonal breeding aquatic habitat to perennial aquatic breeding habitat is allowed under this programmatic biological opinion. Creating new perennial water bodies in the vicinity of California red-legged frog or California tiger salamander populations where the ponds could be colonized by predators will also be avoided. Larval mosquito abatement efforts will be avoided in occupied breeding habitat for the species.

CRLF-CTS-24 Restore Contours of Temporarily Disturbed Areas: Habitat contours will be returned to their original configuration at the end of project activities in all areas that have been temporarily disturbed by activities associated with the project, unless the Subapplicant and the Service determine that it is not feasible or modification of original contours will benefit the California red-legged frog and California tiger salamander.

CRLF-CTS-25 Use of Native Plants for Revegetation: Plants used in revegetation will consist of native riparian, wetland, and upland vegetation suitable for the area. Locally collected plant materials will be used to the extent practicable. This measure will be implemented in all areas disturbed by activities associated with the project, unless the Subapplicant and the Service determine that it is not feasible or practical.

CRLF-CTS-26 Practices to Prevent Pathogen Contamination in Revegetation and Restoration: The Subapplicant will refer to the following restoration design considerations and practices to help prevent pathogen contamination in revegetation and restoration as published by the Working Group for *Phytophthora* in Native Habitats in order to address the risk of introduction and spread of *Phytophthora* and other plant pathogens in site plantings:

a. Design restoration with lower initial plant density. Planting large quantities of nursery plants increases the likelihood that some of those plants may be infested with *Phytophthora* or other plant pathogens. The greater the number of plants installed the higher the risk for pathogen introduction. The closer the plants are to one another the higher the likelihood of pathogen spread.
b. To the extent possible, use direct seeding of native plant seeds or cuttings instead of container stock. Planting locally-collected seeds or cuttings rather than installing container stock can minimize the risk of introducing pathogens to a site.
c. Ensure the use of clean nursery stock. To prevent and manage the introduction and spread of *Phytophthora* and other plant pathogens during revegetation and restoration activities, it is essential that projects use clean nursery stock grown with comprehensive best management practices.
d. Prevent contamination in site preparation, installation, and maintenance. Implementing best management practices to prevent pathogen introduction and spread is also critical during all other phases of revegetation and restoration to reduce contamination risk. For detailed guidance on how to prevent and manage *Phytophthora* during various aspects of restoration, including nursery plant production, see The Phytophthora in Native Habitats Work Group "Restoration Guidance" at www.calphytos.org.
e. Reduce the potential for pathogen spread and introduction due to movement or use of non-sanitized vehicles, tools, footwear or inadvertent use of contaminated materials (e.g. soil erosion protection wattles and mulch, or non-sanitized materials recycled from other projects such as rebar, fencing materials, etc.). Fundamental principles include:
    i. Minimize project footprint and soil disturbance. Keep the number of vehicle pass-throughs and other disturbances during site activities to the least necessary. Avoid visits when conditions are wet, and areas are muddy. Park vehicles in designated staging areas.
    ii. Follow sanitation practices. *Phytophthora* and many other pathogens move when contaminated soil is transferred on vehicle tires, footwear, on contaminated tools or infested plant materials. Follow sanitation best management practices: tools, boots, and vehicles will be visibly free of soil before and after use.
    iii. Promote prevention through education. Ensure that onsite personnel are aware of the risk of inadvertent pathogen introductions and understand how to prevent pathogen introduction and spread. A pre-project meeting that provides appropriate BMP training to all workers and oversight managers who will be onsite during the project will help avoid confusion and delays in the field and will ensure in advance that everyone understands the project goals related to pathogen prevention.

Giant Garter Snake Conservation Measures

GGS-1 Seasonal Avoidance: To the extent practicable, confine construction activity within 200 feet of giant garter snake habitat to the period between May 1 and October 1. This is the active period for giant garter snake and direct mortality is lessened because snakes are expected to actively move and avoid danger.

GGS-2 Site Restrictions: Work activities will be restricted to existing roads and trails to the maximum extent possible. When existing roads and trails cannot be followed, and disturbance is giant garter snake habitat, vegetation will be removed by hand to prevent mortality associated with mowers and other landscaping equipment. Project-related vehicles will observe a 15-mph speed limit within construction areas and access roads (except on County road and state and federal highways). This is particularly important during the time period when the snake may be sunning or moving along roadways.

GGS-3 Clearance Surveys: Within 24 hours prior to the commencement of construction activities, the Action Area will be surveyed for giant garter snakes by a SFWO-approved biologist. The biologist will provide the Service with a written report (e-mail is acceptable) that adequately documents the pre-construction survey results within 24-hours of commencement of construction activities. The Action Area will be re-inspected by the SFWO-approved biologist whenever a lapse in construction activity of 2 weeks or greater has occurred. If a giant garter snake is encountered during surveys, cease activities until the SFWO-approved biologist has determined that the snake will not be harmed or the snake leaves the work area on its own.

GGS-4 Dewatering: Aquatic habitat for the snake will be dewatered, and then remain dry and absent of aquatic prey for 15 days prior to the initiation of construction activities. If complete dewatering is not possible, the Service will be contacted to determine what additional measures may be necessary to minimize effects to the snake.

GGS-5 Fencing: Prior to October 1st and after aquatic habitat has been dewatered, high visibility fencing will be erected along the edge of construction areas bordering suitable giant garter snake habitat to identify and protect these areas from encroachment of personnel and equipment. These areas will be avoided by all construction personnel. The fencing will be inspected by the Subapplicant before the start of each work day and maintained by the Subapplicant until completion of the project. Fencing will be established in the uplands immediately adjacent to aquatic snake habitat and extending up to 200 feet from construction activities. Snake exclusionary fencing will be buried at least six inches below the ground to prevent snakes from attempting to burrow or move under the fence. To prevent giant garter snake from becoming entangled, trapped, or injured, erosion control materials that use plastic or synthetic monofilament netting will not be used in the Action Area. Acceptable materials include natural fibers such as jute, coconut, twine or other similar fibers.

GGS-6 Contacting the Service: If construction activities in giant garter snake habitat are necessary between October 2 and April 30, the Service's SFWO will be contacted to determine whether additional measures are necessary to avoid and minimize take. Recommended measures will be implemented.

GGS-7 Biological Monitor: A SFWO-approved biologist will inspect and monitor all construction-related activities within the Action Area to attempt to minimize take of the snake or the destruction of its habitat. If snakes are encountered during construction activities, the biologist will notify the SFWO immediately to determine the appropriate procedures. A report will be submitted, including date(s), location(s), habitat description, and any corrective measures taken to protect the snake, within one (1) business day.

GGS-8 Reporting: The SFWO-approved biologist will be required to report any take of listed species to the SFWO immediately by a written letter addressed to the appropriate Service office within one (1) working day of the incident.

Alameda Whipsnake Conservation Measures

The Subapplicant will implement the following measures in Alameda whipsnake supporting habitat:

AWS-1 Environmental Awareness Training: Prior to construction, a SFWO-approved biologist with experience in the ecology and identification of the Alameda whipsnake will conduct an education program for all construction personnel, including contractors and subcontractors. Interpretation will be provided for non-English speaking workers. The same instruction will be provided to any new workers at the site before they are authorized to perform project work. Fact sheets conveying this information and color photographs of the species will be prepared for distribution to the above-mentioned people and anyone else who may enter the Action Area. The program will include, at a minimum:

a. a brief description of the species and their habitat needs;
b. any reports of occurrences in the Action Area;
c. an explanation of the species' status and protection under the Act;
d. communication and work stoppage procedures in case an individual is observed within the Action Area; and
e. a list of avoidance and minimization measures being taken to reduce effects to the species during construction and implementation.

AWS-2 Site Restrictions: The following site restrictions will be implemented to avoid or minimize effects on the Alameda whipsnake and its habitat:

a. A speed limit of 15 miles per hour (mph) in the project footprint in unpaved areas will be enforced to reduce dust and excessive soil disturbance.
b. Construction and ground disturbance will occur only during daytime hours, and will cease no less than 30 minutes before sunset and may not begin again earlier than 30 minutes after sunrise.
c. Routes and boundaries of roadwork will be clearly marked prior to initiating construction or grading.
d. To the maximum extent practicable, any borrow material will be certified to be non-toxic and weed free.
e. All food and food-related trash items will be enclosed in sealed trash containers and properly disposed of offsite.
f. No pets will be allowed anywhere in the Action Area during construction.

AWS-3 Biological Monitor: The SFWO-approved biologist will be onsite during initial ground-disturbing activities, and thereafter as needed to fulfill the role of the approved biologist as specified in project permits. The SFWO-approved biologist will keep copies of applicable permits in their possession when onsite. Through the Resident Engineer, Project Manager or their designee, the SFWO-approved biologist will have the authority to communicate either verbally, by telephone, e-mail or hardcopy with all project personnel to ensure that take of listed species is minimized and permit requirements are fully implemented. Through the Resident Engineer, Project Manager or their designee, the SFWO-approved biologist will have the authority to temporarily stop project activities to minimize take of listed species or if they determine that any permit requirements are not fully implemented. If the SFWO-approved biologist exercises this authority, the SFWO will be notified by telephone and e-mail within 24 hours.

AWS-4 Habitat Avoidance: During project implementation, avoid the following habitats for this species:

a. To the extent possible, all rock outcroppings will be avoided.
b. Ground disturbance and vegetation clearing in scrub/chaparral habitat will be avoided to the maximum extent possible. Where disturbance cannot be avoided in this habitat type, work will be limited to the fall season of September to November in order to allow the young of the year time to become sufficiently capable of escaping such activities.

AWS-5 Seasonal Avoidance: Construction activities will occur between June 15 - October 31, when Alameda whipsnakes are more active, capable of escaping, and less likely to be impacted.

AWS-6 Use Hand Operated Equipment: Work activities will be restricted to existing roads and trails to the maximum extent possible. When existing roads and trails cannot be followed, shrub vegetation will be removed by equipment operated by hand to prevent mortality associated with mowers or other large mechanical equipment. A SFWO-approved biologist experienced in identifying Alameda whipsnake will be present during vegetation removal.

AWS-7 Pre-construction Surveys: Pre-construction surveys for the Alameda whipsnake will be conducted by the SFWO-approved biologist no more than 20 calendar days prior to any initial ground disturbance within Alameda whipsnake habitat. These surveys will consist of walking the project limits and, if possible, any accessible adjacent areas within at least 50 feet of the project limits. The SFWO-approved biologist will investigate potential cover sites when it is feasible and safe to do so. This includes thorough investigation of mammal burrows, rocky outcrops, appropriately sized soil cracks, tree cavities, and debris.

AWS-8 Clearance Surveys: No more than 24 hours prior to the date of initial ground disturbance and vegetation clearing, a SFWO-approved biologist with experience in the identification of the Alameda whipsnake will conduct clearance surveys and monitoring within 50 feet of the project site. The SFWO-approved biologist will investigate all areas that could be used by Alameda whipsnakes for sheltering, movement, and other essential behaviors. This includes an adequate examination of rock outcroppings and mammal burrows. Safety permitting, the SFWO-approved biologist will investigate areas of disturbed soil for signs of the listed species within 30 minutes following the initial disturbance of that given area. The SFWO-approved biologist will conduct clearance surveys at the beginning of each day and regularly throughout the workday when construction activities are occurring that may result in take of Alameda whipsnake.

AWS-9 Entrapment Prevention: To prevent inadvertent entrapment of Alameda whipsnakes during construction excavated holes or trenches more than one foot deep with walls steeper than 30 degrees will be covered at the close of each working day by plywood or similar materials. Alternatively, an additional 4-foot high vertical barrier, independent of exclusionary fences, will be used to further prevent the inadvertent entrapment of listed species. If it is not feasible to cover an excavation or provide an additional 4-foot high vertical barrier, independent of exclusionary fences, one or more escape ramps constructed of earth fill or wooden planks will be installed. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If at any time a trapped Alameda whipsnake is discovered, the onsite biologist will immediately place escape ramps or other appropriate structures to allow the animal to escape or the Service will be contacted by telephone for guidance. The SFWO will be notified of the incident by telephone and e-mail within 24 hours.

AWS-10 Wildlife Exclusion Fencing: Prior to the start of construction in individual construction areas, wildlife exclusion fencing will be installed along the project footprint in all areas where the Alameda whipsnake could enter the active site. The location and extent of wildlife exclusion fencing will be presented to the SFWO for approval prior to project initiation. The Subapplicant will include the exclusion fencing specifications on the final project plans. The Subapplicant will include the exclusion fencing specifications, including installation and maintenance criteria, in the bid solicitation package special provisions. The fencing will remain in place throughout the duration of the construction activities within the individual work areas and will be regularly inspected and fully maintained. Repairs to the fence will be made within 24 hours of discovery. Upon completion of activities within the given area, the fence will be completely removed; the area cleaned of debris and trash, and returned to natural conditions.

AWS-11 Fencing: Prior to ground disturbance, active areas within the project footprint will be delineated with temporary, high-visibility fencing to prevent the encroachment of construction personnel and equipment outside the described project footprint. The fencing will be removed after all construction equipment is removed from those segments of the project.

AWS-12 Using Cover Boards: The SFWO-approved biologist will place cover boards in strategic locations throughout the project footprint during the pre-construction surveys. During construction, these cover boards will be checked on a daily basis for the Alameda whipsnake when the SFWO-approved biologist is onsite.

AWS-13 Reporting: The SFWO will be notified within one (1) working day if an Alameda whipsnake is discovered within the Action Area. The Resident Engineer or Project Manager will immediately contact the SFWO-approved biologist in the event that an Alameda whipsnake is observed within a construction zone. The Resident Engineer will suspend construction activities within a 50-foot radius of the animal until the animal leaves the site voluntarily or as a last option, the animal is captured and relocated according to SFWO-approved protocol.

AWS-14 Suitable Erosion Control Materials: Plastic monofilament netting (erosion control matting) or similar material will be prohibited from use on the project because the Alameda whipsnake may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

AWS-15 Limitation on Rodenticide Use: No rodenticides will be used at the project site during construction in areas that support suitable habitat for the Alameda whipsnake

AWS-16 Encounters with Species: Each Alameda whipsnake encounter will be treated on a case-by-case basis in coordination with the SFWO but general guidance is as follows: (1) leave the non-injured animal if it is not in danger; or, (2) move the animal to a nearby location if it is in danger. These options are further described as follows:

a. When an Alameda whipsnake is encountered in the Action Area the first 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 monitor then needs to assess the situation in order to select the course of action that will minimize adverse effects to the individual. Contact the SFWO once the site is secure. Contact the SFWO again prior to the start of construction to confirm the animal's status.
b. The first priority is to 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. The animal will not be

picked up and moved because it is not moving fast enough or it is inconvenient for the construction schedule. This guidance only applies to situations where an animal is encountered while moving under conditions that make their upland travel feasible. This does not apply to animals that are uncovered or otherwise exposed or in areas where there is not sufficient adjacent habitat to support the life history of the Alameda whipsnake if they move outside the construction footprint.

c. Avoidance is the preferred option if the animal is not moving or is within some sort of burrow or other refugia. In this case, the area will be well marked for avoidance by construction and a SFWO-approved biological monitor will be assigned to the area when work is taking place nearby.
d. The animal will be captured and moved when it is the only option to prevent its death or injury.
e. If appropriate habitat is located immediately adjacent to the capture location then the preferred option is short distance relocation to that habitat. This must be coordinated with the SFWO, but the general guidance is the 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 owner's written permission. It is the Subapplicant's responsibility to arrange for that permission.
f. The release must be coordinated with the SFWO and 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 or other suitable refugia.
g. Only SFWO-approved biologists for the project can capture Alameda whipsnakes.

Valley Elderberry Longhorn Beetle Conservation Measures

In general terms, the *May 2017 Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (VELB) will be followed. Below is a summary of some of the key measures to implement on Subapplicant's proposed projects that may affect VELB. If elderberry shrubs occur on or within 50 meters (165 feet) of the Action Area, adverse effects to VELB may occur as a result of project implementation. If the project may affect VELB or its habitat, appropriate avoidance and minimization measures are recommended. Not all measures may be appropriate for every project, and Subapplicants will implement the measures that are identified in the ESA Review Form for a specific project. FEMA will submit to the SFWO the completed ESA Review Form for projects that are covered under this programmatic biological opinion, outlining the applicable measures to protect VELB. This text is intended to provide language that may be used by the Subapplicants to describe avoidance and minimization measures for their proposed project.

VELB-1 Fencing: All areas to be avoided during construction activities will be fenced and/or flagged as close to construction limits as feasible.

VELB-2 Avoidance Area: Activities that may damage or kill an elderberry shrub (e.g., trenching, paving, etc.) may need an avoidance area of at least 6 meters (20 feet) from the drip-line, depending on the type of activity.

VELB-3 Worker Education: A SFWO-approved biologist will provide training for all contractors, work crews, and any onsite personnel on the status of the VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for non-compliance.

VELB-4 Biological Monitor: A SFWO-approved biologist will monitor the work area at project-appropriate intervals to assure that all avoidance and minimization measures are implemented. The amount and duration of monitoring will depend on the project specifics and the contractor will discuss it with the SFWO-approved biologist.

VELB-5 Seasonal Avoidance: As much as feasible, all activities that could occur within 50 meters (165 feet) of an elderberry shrub will be conducted between August and February, outside of the flight season of the VELB, which occurs from March to July, coinciding with the bloom period of the elderberry plant.

VELB-6 Trimming: Trimming may remove or destroy VELB eggs or larvae and may reduce the health and vigor of the elderberry shrub. In order to avoid and minimize adverse effects to VELB when trimming, trimming will occur between November and February and will avoid the removal of any branches or stems that are $\geq$ 1 inch in diameter. Measures to address regular or large-scale maintenance (trimming) will be established in consultation with the SFWO.

VELB-7 Limitations on Chemical Use: Herbicides will not be used within the drip-line of the shrub. Insecticides will not be used within 30 meters (98 feet) of an elderberry shrub. All chemicals will be applied using a backpack sprayer or similar direct application method.

VELB-8 Mowing: Mechanical weed removal within the drip-line of the shrub will be limited to the season when adults are not active (August - February) and will avoid damaging the elderberry.

VELB-9 Erosion Control and Revegetation: Erosion control will be implemented and the affected area will be revegetated with appropriate native plants.

VELB-10 Transplanting: In order to protect VELB larvae to the greatest extent possible, we recommend that all elderberry shrubs with stems greater than 1 inch in diameter be transplanted under the following conditions:

a. If the elderberry shrub cannot be avoided.
b. If indirect effects will result in the death of stems or the entire shrub.

Removal of entire elderberry plants without disturbance to the surrounding habitat is uncommon, but may occur on certain projects. The removal may either include the roots or just the removal of the aboveground portion of the plant. The SFWO encourages project applicants to attempt to remove the entire root ball and transplant the shrub, if possible. In order to minimize the fragmentation of VELB habitat, the SFWO encourages applicants to relocate elderberry shrubs as close as possible to their original location. Elderberry shrubs may be relocated adjacent to the project footprint if: 1) the planting location is suitable for elderberry growth and reproduction; and 2) the project proponent is able to protect the shrub and ensure that the shrub becomes reestablished. If these criteria cannot be met, the shrub may be transplanted to an appropriate SFWO-approved mitigation site. Any elderberry shrub that is unlikely to survive transplanting because of poor condition or location, or a shrub that will be extremely difficult to move because of access problems, may not be appropriate for transplanting. The following transplanting guidelines may be used by agencies/applicants in developing their VELB conservation measures:

Monitor. A SFWO-approved biologist will be onsite for the duration of transplanting activities to assure compliance with avoidance and minimization measures and other conservation measures.

Exit Holes. Exit-hole surveys will be completed immediately before transplanting. The number of exit holes found, GPS location of the plant to be relocated, and the GPS location of where the plant is transplanted will be reported to the Service and to the California Natural Diversity Database (CNDDB).
Timing. Elderberry shrubs will be transplanted when the shrubs are dormant (November through the first two weeks in February) and after they have lost their leaves. Transplanting during the non-growing season will reduce shock to the shrub and increase transplantation success.
Transplanting Procedure. Transplanting will follow the most current version of the ANSI A300 (Part 6) guidelines for transplanting (http://www.tcia.org/).
Trimming Procedure. Trimming will occur between November and February and will minimize the removal of branches or stems that exceed 1 inch in diameter.

VELB-11 Impacts to Individual Shrubs: In certain instances, impacts to elderberry shrubs, but not the surrounding habitat may occur. This could take the form of trimming or complete removal of the plant. Trimming elderberry shrubs may result in injury or death of eggs, larva, or adults depending on the timing and extent of the trimming. Since the larva feed on the elderberry pith while they are developing, any trimming that may affect the health of the plant and cause the loss of stems may kill any larva in those stems. No adverse impacts to the VELB will occur if trimming does not remove stems/branches that are ≥1 inch in diameter and is conducted between November and February. Trimming that occurs outside of this window or removes branches ≥ 1 inch in diameter may result in adverse effects to VELB. In order to assess the risk of take from trimming activities, we recommend the following be evaluated:

a. Conduct an exit hole survey on the plant.
b. Evaluate the surrounding habitat (riparian vs. non-riparian).
c. Evaluate the potential suitability of the plant to provide VELB habitat.
    i. Riparian plants are much more likely to be occupied or colonized by VELB.
    ii. Plants in non-riparian locations will be evaluated using the criteria in Figure 2.

VELB-12 Other Activities: The SFWO's Framework for VELB may not be applicable for restoration, floodway maintenance, and other large scale habitat modification activities. These activities and the potential effects to VELB and its habitat will be considered on a project-by-project basis and discussed with the SFWO. The SFWO recommends that project proponents consider the effects to the species on a landscape level and ultimately seek to protect, preserve, and restore the continuity of VELB habitat. These and similar activities that may adversely impact the VELB and its habitat at landscape scales will consider avoidance and minimization strategies that are appropriate for the specific project. Some possible conservation measures to consider for these large-scale projects include:

a. Transplanting all affected elderberries to a similar onsite location.
b. Maintaining patches of appropriate habitat in areas where large-scale removal of elderberry shrubs will occur.
c. Scale trimming, removal, and other activities that allow VELB to persist within the area.

California Freshwater Shrimp Conservation Measures

CAFS-1 Biological Monitor: A SFWO-approved biologist will conduct surveys of suitable habitat within the Action 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.

CAFS-2 Species Observations and Handling Protocol: If California freshwater shrimp are present in the Action Area the following procedures will be used:

a. Prior to any California freshwater shrimp handle/capture activities, the SFWO 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" D-frame net) or small minnow dip nets] and relocated out of the work area in the net or placed in buckets containing stream water and then moved directly to the nearest suitable habitat in the same branch of the creek. Suitable habitat will be identified prior to capturing California freshwater shrimp to minimize holding time. 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 SFWO-approved biologist has determined that all shrimp have been effectively relocated, barrier seines or exclusion fencing no greater than 5 mm will be installed to prevent shrimp from moving back in, as appropriate.
d. Only SFWO-approved biologists will participate in the capture, handling, and monitoring of California freshwater shrimp. The SFWO-approved biologist will report the number of captures, releases, injuries, and mortalities to the Service within 30 days of project completion. If take exceeds the levels anticipated in this programmatic biological opinion, work will stop immediately and the SFWO will be notified within one working day.

CAFS-3 Seasonal Avoidance: No work during wet weather or where saturated ground conditions exist; if a 60% chance of a one half inch of rain or more within a 24-hour period is forecasted, then operations will cease until 24 hours after rain has ceased.

CAFS-4 Habitat Protection: Habitat for this species will be protected, as follows:

a. No large woody debris (LWD) will be removed in 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 over 3 inches in diameter at breast height will not be removed and there will be no reduction in canopy cover provided by hardwoods or conifers.
b. Disturbance and removal of aquatic vegetation will be minimized to the extent practicable. Downed trees, stumps and other basking sites and refuges within these aquatic habitats will remain undisturbed as much as possible.

CAFS-5 Revegetation: The stream bank will be planted with species which 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. The revegetation will include plantings such as widely spaced trees, willow sprigs, and sedges near the water's edge, plantings of herbaceous plant species to fill in gaps and therefore augment existing habitat.

CAFS-6 Site Restrictions: New access routes requiring tree removal and grading will be limited to no more than two. Access routes will not be along the top of the stream bank but relatively perpendicular (45 to 90 degrees is acceptable) to the bank.

CAFS-7 Site Access: 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-8 Erosion Control: Any disturbed ground must receive appropriate erosion control treatment (mulching, seeding, planting, etc.) prior to the end of the construction season, prior to ceasing operations due to forecasted wet weather, and within seven days of project completion. Operations will use all feasible techniques to prevent any sediment from entering a drainage system.

CAFS-9 Suitable Erosion Control Materials: Erosion control materials will not include plastic mono-filament netting or similar materials in which animals might become entangled.

CAFS-10 Cleanup After Construction: Work pads, falsework, and other construction items will be removed from the 100 year floodplain by the end of the construction window.

CAFS-11 Construction Design: Prior to removal of an existing structure, a debris catching platform will be constructed under the structure.

CAFS-12 Waste Management: Trash will be properly contained, removed from the work areas, and disposed of regularly. Following construction, all trash and construction debris will be removed from the Project footprint.

CAFS-13 Fueling Restrictions: Fueling and maintenance of vehicles and equipment will occur at least 50 feet from any riparian or aquatic habitat. Prior to the start of construction a plan will be prepared to ensure a prompt and effective response to any accidental spills. All workers will be informed of the importance of preventing spills and of the appropriate measures to take if a spill occurs.

Multiple Butterfly Species Conservation Measures

Butterfly Species	Bloom/Flight Season	Host Plants
Bay Checkerspot Butterfly	February - early May	California plantain (*Plantago erecta*), purple owl's clover (*Castilleja densiflora*) and exserted paintbrush (*C. exserta*)
Callipe Silverspot Butterfly	mid-May - late July	Johnny jump-up (*Viola pedunculata*)
Mission Blue Butterfly	Late March - early July	Three lupine species (*Lupinus albifrons, L. formosus;* and *L. varicolor*)
Myrtle's silverspot butterfly	mid-June - early October	western dog violet (*Viola aduca*)
San Bruno elfin	Late February - mid-April	Stone crop (*Sedum spathulifolium*)

LEP-1 Pre-construction Surveys: The Subapplicant will implement the following measure depending on the time of year for project construction:

a. During the non-flight season, pre-construction surveys for caterpillars and the larval host plants will be conducted during the typical bloom season. A SFWO-approved biologist, able to identify the larval host plants and caterpillars of the listed butterfly species, will conduct up to three surveys prior to the start of construction to determine the use of the site by the listed butterflies.

b. During the flight season, pre-construction surveys for butterflies and the larval host plants will be conducted. A SFWO-approved biologist, able to identify the butterflies and their host plants, will conduct up to three surveys prior to the start of construction to determine the use of the site by the listed butterflies. If flight surveys are not possible, then the butterfly species associated with the larval host plant will be assumed present.

LEP-2 Biological Monitor: During the adult flight season of listed butterfly species, a SFWO-approved biologist will be present when construction activities occur in or within 100 feet of suitable habitat (dispersal habitat as well as areas containing the larval host plant and adult food plants). If one or more adult listed butterflies are observed in the work area, work activities will temporarily cease unless the SFWO-approved biologist determines that work activities will not directly affect the individual(s).

LEP-3 Fencing: Any larval food plants found within 300 feet of the project footprint will be clearly marked and will be avoided to the maximum extent practicable. Orange fencing/flagging will be placed along the edge of the work area near any larval food plants to prevent workers and vehicles from entering this area. Fencing/flagging will be installed prior to any ground disturbing or vegetation removal activities. A SFWO-approved biologist will supervise the installation of flagging or fencing around stands of known listed 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 flagging/fencing will be field-adjusted by the SFWO-approved biologist as necessary. The temporary fencing/flagging will be furnished, constructed, maintained, and later removed and specified in the construction bid documents. Temporary fencing/flagging will be at least 4-foot-high and constructed of high visibility material (e.g., orange, commercial- quality woven polypropylene or similar material). No construction activities will be permitted within the fenced/flagged area. Warning signs indicating the sensitivity of the area will be attached to the fencing/flagging.

LEP-4 Monitoring Log: Each day the SFWO-approved biologist will monitor for listed butterflies, inspect the fencing/flagging and immediately notify the resident engineer (or their designated contact) to address any necessary fencing/flagging repairs. A biological monitoring log of construction site conditions and observations will be maintained and kept on file.

LEP-5 Dust Control: The SFWO-approved biologist will ensure that dust is controlled during construction by periodically watering down construction areas within 100 feet of listed butterfly habitat as necessary. Watering down the construction area will prevent dirt from becoming air borne and accumulating on larval host plants and adult food source plants for listed butterflies.

Conservation Measures for Vernal Pool Fairy Shrimp, Conservancy Fairy Shrimp, Longhorn Fairy Shrimp, Vernal Pool Tadpole Shrimp

To avoid and minimize adverse effects to the vernal pool branchiopods, the measures listed below will be implemented in the project footprint where suitable listed branchiopod habitat (e.g., vernal pools, seasonal wetlands) occurs and the species have potential to occur.

VPBR-1 Pre-construction Surveys: If possible, prior to construction activities, the SFWO-approved biologist will conduct pre-construction, reconnaissance surveys in seasonally inundated habitats (seasonal wetland, non-inundated wetlands) within the project footprint. The SFWO-approved biologist will conduct general aquatic surveys at a suitable interval after the first significant storm event of the rainy season (October 15 to June 1), prior to construction activities. The surveys

will include a habitat assessment of the hydrological, biological, and ecological conditions of each seasonal wetland and open waters. The habitat assessment will provide information regarding the quality and suitability of seasonal wetlands for the vernal pool branchiopods covered under this programmatic biological opinion (vernal pool fairy shrimp, Conservancy fairy shrimp, longhorn fairy shrimp, and vernal pool tadpole shrimp). If any vernal pool branchiopods are found during the surveys, the SFWO-approved biologist will submit a report to the SFWO within 1 month of completing the field work. The report will provide results of all surveys, a summary of all the data collected, and the habitat assessment. If surveys are not possible, then listed vernal pool branchiopod species presence will be assumed on all suitable habitat within the Action Area.

VPBR-2 Biological Monitor: A SFWO-approved biologist will monitor all construction activities within 250 feet of suitable habitat for listed vernal pool branchiopods to ensure that no unnecessary take or destruction of habitat occurs.

VPBR-3 Exclusion Areas: Non-disturbance exclusion zones will be established, maintained, and monitored by a SFWO-approved biological monitor to ensure that take of vernal pool branchiopods or destruction of their habitat does not occur outside of the project footprint, in areas where suitable habitat (e.g., vernal pools, seasonal wetlands) occurs and the species have potential to occur. 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; and
b. Mixing of pesticides, herbicides, or other potentially toxic chemicals.

VPBR-4 Seasonal Avoidance: Work within 250 feet of suitable listed vernal pool branchiopod 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 adverse impacts to aquatic habitats.

VPBR-5 Work Restrictions During Dry Season: A SFWO-approved biologist will flag or monitor all operations and maintenance work during the *dry season* (generally June 1 to October 15) within 250 feet of a vernal pool, vernal pool grassland, or seasonal wetland. The following buffers will be enforced:

a. hand-held herbicide application is prohibited within the pool or at the edge of the pool;
b. power spray herbicide application is prohibited within 100 feet of the edge of the pool;
c. broadcast herbicide application is prohibited within 150 feet of the edge of the pool; and
d. ground-disturbing activities are prohibited within 25 feet of the edge of the pool.

VPBR-6 Work Restrictions During Wet Season: If any construction activities remain and must occur during the October 15 - June 1 *wet period*, exclusion fencing and erosion control materials will be placed around the vernal pools and other seasonal wetlands as determined by the SFWO-approved 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 SFWO-approved biologist will erect and maintain the exclusion fencing.

VPBR-7 Erosion Control: Any vernal pool, vernal pool grassland, or seasonal wetland will be protected from siltation and contaminant runoff by use of erosion control. Erosion-control measures will be placed between the outer edge of the buffer and the activity area.

VPBR-8 Suitable Erosion Control Materials: Erosion-control materials will be of a tightly woven natural fiber netting or similar material that will not entrap reptiles and amphibians (e.g., coconut coir matting). No micro-filament netting will be used. All fiber rolls and hay bales used for erosion control will be certified as free of noxious weed seed.

VPBR-9 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-storm water discharge.

VPBR-10 Monitoring During Wet Season: A SFWO-approved biologist will flag or monitor all operations and maintenance work during the *wet season* (generally October 1 to June 1) within 150 feet of a vernal pool, vernal pool grassland, or seasonal wetland. The following buffers will be enforced:

a. Hand-held herbicide application is prohibited within 25 feet of the edge of the pool;
b. Power spray herbicide application is prohibited within 100 feet of the edge of the pool;
c. Broadcast herbicide application is prohibited within 150 feet of the edge of the pool;
d. Manual clearing of vegetation is prohibited at the pool or beyond the edge of the pool;
e. Mechanical clearing of vegetation is prohibited within 100 feet of the edge of the pool; and
f. Ground-disturbing activities are prohibited within 50 feet of the edge of the pool.

VPBR-11 Vehicle Maintenance: Vehicles will be inspected daily for fluid leaks before leaving a staging area.

VPBR-12 Site Restrictions: Routine maintenance activities within 250 feet of vernal pool and swale habitat will be avoided to the maximum extent possible.

VPBR-13 Use of Native Plants for Revegetation: When revegetating upland areas to pre-project condition, native plants will be used to the maximum extent practicable.

VPBR-14 Invasive Plant Species Prevention: To minimize the introduction of invasive plant species, construction vehicles will be cleaned prior to any work within 150 feet of vernal pool branchiopod habitat.

Conservation Measures for Vernal Pool Listed Plants

These measures apply to the following 19 listed vernal pool plant species: Burke's goldfields (*Lasthenia burkei*), Butte County meadowfoam (*Limnanthes floccosa ssp. californica*), Calistoga allocarya (*Plagiobothrys strictus*), Colusa grass (*Neostapfia colusana*), Contra Costa goldfields (*Lasthenia conjugens*), few-flowered navarretia (*Navarretia leucocephala ssp. pauciflora [=N. pauciflora*]), fleshy owl's-clover (*Castilleja campestris ssp. succulenta*), Greene's tuctoria (*Tuctoria greenei*), hairy Orcutt grass (*Orcuttia pilosa*), Hoover's spurge (*Chamaesyce hooveri [=Euphorbia hooveri*]), Lake County stonecrop (*Parvisedum leiocarpum [=Sedella leiocarpa*]), Loch Lomond coyote thistle (*Eryngium constancei*), many-flowered navarretia (*Navarretia leucocephala ssp. plieantha*), Sacramento Orcutt grass (*Orcuttia viscida*), San Joaquin Orcutt grass (*Orcuttia inaequalis*), Sebastopol meadowfoam (*Limnanthes vinculans*), Slender Orcutt grass (*Orcuttia tenuis*), Solano grass (*Tuctoria mucronata*), and Sonoma sunshine (*Blennosperma bakeri*).

To avoid and minimize adverse effects to the vernal pool plants, the measures listed below will be implemented in the project footprint where suitable vernal pool habitat (e.g., vernal pools, seasonal wetlands) occurs and the species have potential to occur.

VP PLANT-1 Pre-construction Surveys: If possible, prior to construction activities, the SFWO-approved biologist will conduct protocol-level bloom-season plant surveys in seasonally inundated habitats (seasonal wetland, non-inundated wetlands) within the project footprint. If any listed vernal pool plant species are found during the surveys, the SFWO-approved biologist will submit a report to the SFWO within 1 month of completing the field work. The report will provide results of all surveys, a summary of all the data collected, and the habitat assessment. Information regarding the location of listed plant populations will be provided to CDFW's California Natural Diversity Database (CNNDB) according to their reporting protocols. If surveys are not possible, then listed vernal pool species presence will be assumed on all suitable habitats within the Action Area.

VP PLANT-2 Flagging: Flagging or other field markers identifying the plants, or in the event 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.

VP PLANT-3 Biological Monitor: A SFWO-approved biologist will monitor all construction activities within 250 feet of suitable habitat for listed vernal pool plants to ensure that no unnecessary loss or destruction of habitat occurs.

VP PLANT-4 Exclusion Areas: A SFWO-approved biologist will delineate a 50-foot avoidance buffer around all federally-listed plants or their suitable habitat. The non-disturbance exclusion zones will be established, maintained and monitored by a SFWO-approved biological monitor to ensure that loss of listed vernal pool plants or destruction of their habitat does not occur outside of the project footprint where suitable habitat (e.g., vernal pools, seasonal wetlands) occurs and the species have potential to occur. In addition, 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; and
b. Mixing of pesticides, herbicides, or other toxic chemicals.

VP PLANT-5 Seasonal Avoidance: Work within 250 feet of suitable listed 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 adverse impacts to aquatic habitats.

VP PLANT-6 Work Restrictions During Dry Season: A SFWO-approved biologist will flag or monitor all operations and maintenance work during the *dry season* (generally June 1 to October 15) within 250 feet of a vernal pool, vernal pool grassland, or seasonal wetland. The following buffers will be enforced:

a. Hand-held herbicide application is prohibited within the pool or at the edge of the pool;
b. Power spray herbicide application is prohibited within 100 feet of the edge of the pool;
c. Broadcast herbicide application is prohibited within 150 feet of the edge of the pool; and
d. Ground-disturbing activities are prohibited within 25 feet of the edge of the pool.

VP PLANT-7 Work Restrictions During Wet Season: If any construction activities remain and must occur during the October 15 - June 1 *wet period*, exclusion fencing and erosion control materials will be placed around the vernal pools and other seasonal wetlands as determined by the SFWO-approved 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 SFWO-approved biologist will erect and maintain the exclusion fencing.

VP PLANT-8 Erosion Control: Any vernal pool, vernal pool grassland, or seasonal wetland will be protected from siltation and contaminant runoff by use of erosion control. Erosion-control measures will be placed between the outer edge of the buffer and the activity area.

VP PLANT-9 Suitable Erosion Control Materials: Erosion-control materials will be of a tightly woven natural fiber netting or similar material that will not entrap reptiles and amphibians (e.g., coconut coir matting). No micro-filament netting will be used. All fiber rolls and hay bales used for erosion control will be certified as free of noxious weed seed.

VP PLANT-10 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-storm water discharge.

VP PLANT-11 Monitoring During Wet Season: A SFWO-approved biologist will flag or monitor all operations and maintenance work during the *wet season* (generally October 1 to June 1) within 150 feet of a vernal pool, vernal pool grassland, or seasonal wetland. The following buffers will be enforced:

a. Hand-held herbicide application is prohibited within 25 feet of the edge of the pool;
b. Power spray herbicide application is prohibited within 100 feet of the edge of the pool;
c. Broadcast herbicide application is prohibited within 150 feet of the edge of the pool;
d. Manual clearing of vegetation is prohibited at the pool or beyond the edge;
e. Mechanical clearing of vegetation is prohibited within 100 feet of the edge of the pool; and
f. Ground-disturbing activities are prohibited within 50 feet of the edge of the pool.

VP PLANT-12 Vehicle Maintenance: Vehicles will be inspected daily for fluid leaks before leaving a staging area.

VP PLANT-13 Site Restrictions: Routine maintenance activities within 250 feet of vernal pool and swale habitat will be avoided to the maximum extent possible.

VP PLANT-14 Use of Native Plants for Revegetation: When revegetating upland areas to pre-project condition, native plants will be used to the maximum extent practicable.

VP PLANT-15 Invasive Plant Species Prevention: To minimize the introduction of invasive plant species, construction vehicles will be cleaned prior to entering any vernal pool habitat.

Tidewater Goby Conservation Measures

TIGO-1 Installation of In-water Nets: Prior to initiation of dewatering or sediment removal work, a Service-approved biologist will install 1/8 inch block nets outside the impact areas and across the stream a minimum of 20 feet above and below the locations proposed for excavation. If widely separated sites are involved, more than one set of block nets will be placed to protect the work area. The nets will be installed on the first day of work and monitored thereafter for the duration of the work.

TIGO-2 Environmental Awareness Training: Prior to initiation of dewatering or sediment removal work, hold an environmental awareness training to inform maintenance and management personnel about tidewater gobies, including tidewater goby protected status, proximity to the project site, avoidance/minimization measures to be implemented during the particular project, and the implications of violating the Act and FEMA funding conditions.

TIGO-3 Capture and Relocation: Once the block nets are secured, a Service-approved biologist(s) will remove all tidewater gobies found between the block nets using a 1/8 inch seine and dip nets, and relocate tidewater gobies to suitable habitat downstream of the Action Area. If excavation of a given extent of a basin cannot be completed in one day, a new set or successive sets of block nets will be deployed each day, and subsequent surveys and capture/relocation performed accordingly. Fish released from one day's work will not be released into areas projected to be excavated on successive days.

TIGO-4 Flagging: Clearly flag the limits of construction areas to avoid or minimize impacts to adjacent riparian and upland habitat. Flagging will be no more than 50 feet apart and will be clearly visible to construction workers on the ground and to operators on heavy equipment.

TIGO-5 Erosion Control: Implement erosion and sedimentation control measures (e.g., silt fences, straw bales or wattles) in all areas where disturbed substrate may potentially wash into waters via rainfall or runoff, particularly around stockpiled material and at the downstream end of each project reach. Such measures will remain in place and be inspected periodically until the project is complete and exposed soils are stabilized. Diversion structures, sediment traps/basins and associated equipment (e.g., pumps, lines) will be maintained in optimal working condition for the entire duration of the preparation and construction periods.

TIGO-6 Biological Monitor: A Service-approved biological monitor will remain onsite and search for tidewater gobies and assess turbidity levels within the work areas during all dewatering activities, and will capture and relocate tidewater gobies to suitable habitat as necessary.

TIGO-7 Reporting: Provide a written summary of work performed (including biological survey and monitoring results), best management practices implemented (i.e., use of biological monitor, flagging of work areas, erosion and sedimentation controls) and supporting photographs of each stage. Furthermore, the documentation describing listed species surveys and re-location efforts (if appropriate) will include name of biologist(s), location and description of area surveyed, time and date of survey, all survey methods used, a list and tally of all sensitive animal species observed during the survey, a description of the instructions/recommendations given to the applicant during the project, and a detailed discussion of capture and relocation efforts (if appropriate).

TIGO-8 Hydrology and Topography Protection: Project activities will avoid creation of berms and dykes, steepening of channel slopes, placement of rock slope protection, and other actions that could result in alteration of hydrology, changes to water surface elevation levels, increased flooding, changes to flow velocities, and increased scour within tidewater goby designated critical habitat. However, the in-kind replacement of existing or damaged rock slope protection may occur.

TIGO-9 Limits on Habitat Disturbance: Project activities will not result in permanent loss of tidewater goby designated critical habitat unless the impacts to habitat are determined to be insignificant via project-level consultation (i.e., small permanent impacts that will have a negligible effect on habitat quality for tidewater goby).

Southwestern Willow Flycatcher

SWWF-1 Habitat Assessment: A habitat assessment will be conducted by a Service-approved biologist to determine whether suitable habitat (including foraging, nesting, and dispersal) for the flycatcher occurs in the action area. If suitable habitat for this species is identified in the Action Area and the proposed project may affect suitable habitat that is not known to be occupied by the flycatcher, the Service will be contacted regarding the need for surveys according to Service protocol and those surveys will be conducted, as appropriate. Otherwise, if the Service agrees based on other biological data or reasoning, the species will be determined present in areas with suitable habitat.

SWWF-2 Habitat Buffer: If project activities are conducted during the breeding season (i.e., May 1-September 1), a 500-foot disturbance-free buffer will be established and demarcated by fencing or flagging around occupied habitat. This buffer may be adjusted provided noise levels do not exceed 60 dBA at the edge of the nest site. If the noise meets or exceeds the 60 dBA threshold, or if the biologist determines that the construction activities are disturbing nesting activities, the biologist will have the authority to halt the construction and will devise methods to reduce the noise and/or disturbance in the vicinity.

SWWF-3 No Permanent or Temporary Loss of Habitat: No permanent or temporary loss of flycatcher occupied or designated critical habitat will occur (within or outside of the breeding season).

Least Bell's Vireo Conservation Measures

LBV-1 Habitat Assessment: A habitat assessment will be conducted by a biologist to determine whether suitable habitat (including foraging, nesting, and dispersal) for the least Bell's vireo occurs in the Action Area. If suitable habitat for this species is identified in the Action Area and the proposed project may affect suitable habitat that is not known to be occupied by the least Bell's vireo, the Service will be contacted regarding the need for surveys according to Service protocol and those surveys will be conducted, as appropriate. With Service concurrence, FEMA may also forgo surveys by making a determination that suitable habitat is occupied for the purposes of section 7 consultation.

LBV-2 Seasonal Avoidance: To minimize direct effects to nesting least Bell's vireos, all clearing of vegetation within occupied habitat will occur outside the breeding season (i.e., March 15-September 15) to the maximum extent practicable. If the breeding season cannot be avoided, a Service-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 to occur within 300 feet of the Action Area, project activities may proceed.

LBV-3 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 non-breeding season OR the following will apply:

a. An exclusionary buffer will be established around the nest. The buffer distance will be determined by the Service-approved biologist considering several factors: presence of natural buffers (vegetation/topography), nest height, location of foraging territory, nature of the proposed activities, and baseline levels of noise and human activity. The buffer may range from 50 feet to over 300 feet in width. AND
b. A biologist will monitor the nest during construction for signs of adverse effects including

distress/disturbance (unless "take" is authorized). If adverse effects are detected then the Service-approved biologist will have the authority to stop all construction activating in the vicinity of the nest and will coordinate with the Service to determine whether additional conservation measures will avoid or minimize effects on the nesting birds. Construction may resume only with approval from the Service. AND

c. If construction must occur within the buffer and exclusion zones or otherwise may cause adverse effects on the least Bell's vireo, then take may be authorized and disturbance may occur (as covered under this programmatic biological opinion). Unanticipated adverse effects on the least Bell's vireo will require reinitiation of consultation.

LBV-4 Habitat Avoidance: Staging and temporary construction areas will be located outside of suitable habitat and will utilize existing roads and developed areas to the extent possible. All mature riparian vegetation (e.g., willows and cottonwoods), that are greater than 30 feet in height, will be avoided to the maximum extent possible. If mature riparian vegetation cannot be avoided, it will be either transplanted elsewhere within or near the Action Area or placed horizontally or diagonally outside the project footprint under the direction of a Service-approved biologist.

LBV-5 Habitat Restoration Plan: Prior to construction, prepare a Restoration Plan will be prepared that describes the efforts to restore all the areas of suitable habitat for the least Bell's vireo that were temporarily impacted. The Restoration Plan will be reviewed and approved by the Service.

LBV-6 Limits on Habitat Disturbance: For any specific project, temporary impacts on occupied or designated critical habitat by the least Bell's vireo will be limited to a maximum of 1 acre. Temporary impacts from all the projects covered under this programmatic consultation will also be limited to a maximum of 20 acres of least Bell's vireo occupied or designated critical habitat. In addition, impacts will be limited to 10 territories.

LBV-7 No Permanent Loss of Habitat: No permanent loss of occupied or designated critical habitat for the least Bell's vireo will occur unless the impact to habitat are determined to be insignificant via project-level consultation (i.e., small permanent impacts that will have negligible effect on habitat quality for the least Bell's vireo).

California Least Tern Conservation Measures

CLT-1 Seasonal Avoidance: To avoid the nesting season of the California least tern, project activity in occupied habitat will be allowed from September 30-March 31. Occupied habitat for this species is well documented online. If project activities occur during the nesting season, they will occur at least 800 feet away from California least tern occupied habitat, and noise within occupied habitat will be monitored to ensure that it does not exceed 60 dBA hourly.

CLT-2 Biological Monitor: A Service-approved biologist will monitor all construction activities within occupied habitat to ensure that no take of the species or destruction of occupied habitat occurs. The Service-approved biologist will have stop work authority if adverse effects of nesting California least terns are observed.

CLT-3 Use of Handheld Tools: Non-breeding season project activity in occupied habitat will be limited to the use of handheld tools, including handheld motorized implements such as chain saws and power augers. Tools will be washed prior to use in these habitats to reduce the spread of non-native and invasive plant species and their seeds. No heavy equipment will be allowed within suitable nesting habitats. If handheld motorized tools are used, operators will employ best management

practices to avoid and minimize soil and water contamination from fuel and lubricants. Measures include: a) use spill-resistant fuel and lubricant containers; b) use a portable containment pad for re-fueling in the field; c) immediately report petroleum spills to the landowner, or land management agency, and notify appropriate local authorities for advice and action on containment and cleanup of spills; and d) clearly mark the location and/or boundaries of the spill site to enable rapid remedial action.

CLT-4 Habitat Protection: No soil stabilization materials or offsite materials (e.g., decomposed granite, soil, rocks, etc.) will be added to the surface within occupied habitat. No excavation or grading will be allowed within occupied habitat either.
CLT-5 Flagging: 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-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 within occupied habitat.

CLT-7 Access Restrictions: Access to work sites in occupied habitat will be by foot travel only. Motorized vehicles, including all-terrain vehicles, will not be used in occupied habitat.

CLT-8 Restoration of Work Areas: At the conclusion of the project, areas temporarily affected by project activity will be restored to their pre-project condition (for example, footpaths will be raked to their original ground contour and native vegetation will be reestablished, if necessary).

CLT-9 Waste Management: Trash, food, food containers, and food waste will be secured at all times by individual workers, or placed in animal-proof trash containers placed at the work site. The contents of trash containers will be transferred from the work site at the end of each day.

Marbled Murrelet Conservation Measures

MAMU-1 Work Restrictions in Occupied Habitat: If marbled murrelet surveys (using the 2003 Service survey protocol; Evans Mack *et al.* 2003) determine that the Action Area is occupied **or** if FEMA or the Service presumes marbled murrelet occupancy without conducting surveys, the project Subapplicant will adhere to the following Conservation Measures. Surveyors are required to meet or exceed all training recommendations in Evans Mack et al. (2003), and be registered as qualified surveyors on a current Service 10(a)(1)(A) Recovery Permit.

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

    i. No potential marbled murrelet nest trees will be removed during nesting season (24 March to 15 September). 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-inch 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. Avoid removing or damaging known or potential nest trees, unless they are a confirmed safety hazard. 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. Avoid removing or damaging trees with potential nesting platforms. A platform is a relatively flat surface at least 4-inch diameter and 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 remove the function of suitable nesting habitat.
- While habitat elements may be removed, such as individual large trees if they are a confirmed safety hazard, from nesting habitat, the treatment must not be so extensive as to remove the overall function of the nesting habitat, and will be conducted outside of the nesting season.

v. Non-suitable nest trees or limb trimming or pruning, brush trimming or removal, and hazard tree felling within suitable habitat may occur outside of the nesting season, 16 September to 23 March.

b. Auditory, Visual, or Other Disturbance:

i. Construction equipment must be in good working order, with emphasis on hydraulic and noise abatement systems. Hydraulic leakage and damaged mufflers (or spark arresters) must be promptly addressed and remedied to the degree practicable.

ii. 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 within suitable marbled murrelet nesting habitat during the majority of the murrelet nesting season (*i.e.,* 24 March to 05 August)(Service 2006f).

iii. Between August 06 (date when most marbled murrelets have fledged in coastal northern California) and September 15 (end of marbled 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 the Service guidelines (Service 2006f). 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 will not be necessary.

iv. No human activities will occur within visual line-of-sight of 40 m (131 feet) or less from a known nest or suitable nest tree during the nesting season (24 March to 15 September) (Service 2006f).

MAMU-2 Work Restrictions in Unoccupied Habitat: If recent protocol surveys determine that all suitable marbled murrelet nesting habitat within the Action Area is considered unoccupied, the auditory, visual, and other disturbance measures listed above do not apply for habitat determined to be unoccupied.

MAMU-3 Work Restrictions in Marbled Murrelet Critical Habitat: Ensure that there are no "adverse effects" to designated critical habitat for marbled murrelet within the Action Area. However, the Service has no specific quantitative thresholds, above which there will likely be an

adverse effect to critical habitat. If a Subapplicant's proposed project encounters this situation, contact the Service to determine whether proposed habitat removal within designated critical habitat constitutes an adverse effect. Generally, the removal of a few small trees in unoccupied habitat will not result in "adverse effect" on designated critical habitat.

When working in designated critical habitat for marbled murrelet, all measures described in MAMU-1 Occupied Habitat, or MAMU-2 Unoccupied Habitat for reducing impacts in suitable habitat will also be implemented. This will help reduce effects, and may result in some instances in effects that are insignificant and discountable.

Western Snowy Plover Conservation Measures

The following avoidance and minimization measures apply to Action Areas within suitable snowy plover nesting habitat and designated critical habitat regardless of whether snowy plovers have been detected during Service-approved protocol surveys.

WSP-1 Seasonal Avoidance: Project construction activities in suitable nesting habitat will occur during the species non-breeding season: the period beginning October 1 and continuing through February 28 of the following year or through February 29 in a leap year.

WSP-2 Use of Handheld Tools Only: Project construction activities in suitable nesting habitat will be limited to the use of handheld tools, including handheld motorized implements such as chain saws and power augers. No heavy equipment will be allowed within suitable nesting habitat.

WSP-3 Guidelines for Handheld Tools: If handheld motorized implements are used, operators will employ best management practices to avoid and minimize soil and water contamination from fuel and lubricants. Measures include:

a. Use spill-resistant fuel and lubricant containers;
b. Consider the use of a portable containment pad for re-fueling in the field;
c. Immediately report petroleum spills to the landowner, or land management agency, and notify appropriate local authorities for advice and action on containment and cleanup of spills; and
d. Clearly mark the location and/or boundaries of the spill site to enable rapid remedial action.

WSP-4 Biological Monitor: If project construction activities occur in adjacent to, but not within suitable nesting habitat, then project activities will be conducted during the species non-breeding season, if possible. If non-breeding season construction is not possible, then the Subapplicant will employ a Service-approved biologist to conduct weekly western snowy plover surveys. If western snowy plovers are observed, the Service-approved biologist will notify the Service within 1 day of the observation and will monitor all construction activities conducted adjacent to western snowy plovers suitable nesting habitat. The qualified biologist will have the right and responsibility to stop work if adverse effects of nesting western snowy plovers are observed.

WSP-5 Flagging: When necessary to minimize the area affected by the project, the Subapplicant or their contractors will mark the work site boundaries with flagging or other visible materials, and remove those markers at the conclusion of the project.

WSP-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.

WSP-7 Access Restrictions: Access to work sites will be by foot travel only. Motorized vehicles, including all-terrain vehicles, are not permitted on work sites located within suitable nesting habitat.

WSP-8 Site Restrictions: Vehicles used for transport of personnel will be restricted to existing parking lots or roadside parking areas.

WSP-9 Restore Contours of Temporarily Disturbed Areas: At the conclusion of the project, areas temporarily impacted by project activity will be restored to their pre-project condition (for example, footpaths are to be raked to their original ground contour and cut vegetation is to be removed or piled for future disposal).

WSP-10 Waste Management: Trash, food, food containers, and food waste will be secured at all times by individual workers, or placed in animal-proof trash containers placed at the work site. The contents of trash containers will be transferred from the work site at the end of each day.

WSP-11 Prohibition of Pets Onsite: Pets will be prohibited from all work sites.

Northern Spotted Owl Conservation Measures

The following Conservation Measures are required for Subapplicant's proposed projects and their interrelated and interdependent activities that may affect the northern spotted owl (NSO). These measures are designed to reduce direct and indirect disturbance to individual NSOs, and habitat effects, to an insignificant and discountable level.

NSO-1 Contact the Service for NSO Data Records: If the Subapplicant's proposed project is located within suitable nesting, roosting or foraging habitat (NRF) for the NSO, and may directly or indirectly affect the NSO or its habitat, contact the Service to obtain contact information for local Forest Service, County, or other biologists who can provide NSO survey, Activity Center and habitat suitability data for the Action 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 Action 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 NSO surveys have not been done, or are not current per the 2012 NSO Survey Protocol guidance (depending on activity), and surveys are planned, conduct them according to the 2012 NSO Survey Protocol and follow the seasonal restrictions described below for 'Surveyed Landscape'. If surveys are not planned or feasible, assume occupancy based on the presence of suitable NRF habitat; adhere to the guidance and seasonal restrictions described below for operating in an 'Un-surveyed Landscape'.

a. As an option to the full 6-visit protocol surveys described in the 2012 NSO Survey Protocol, three surveys can be conducted in the year of action implementation. If no NSOs are detected within 0.25 mile of the proposed activities, activities may proceed that year without seasonal restrictions.

NSO-3 Work Restrictions in Previously Surveyed Landscape: If surveys are completed or are current for the Action Area (based on surveys conducted by the applicant/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.
    - 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 NSO 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-July 9.

NSO-4 Work Restrictions in Previously Un-surveyed Landscape: If surveys have not been completed and cannot be done, assume occupancy in the Action 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 un-surveyed suitable NRF habitat between February 1 and July 9.
    - 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 un-surveyed suitable NRF habitat between February 1 and September 15.
    - Suitable habitat includes NSO 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-July 9.

NSO-5 Noise Abatement: Equipment must be in good working order with standard noise abatement devices attached.

NSO-6 Habitat Avoidance: Within all suitable NRF habitat:

a. Avoid removing or damaging known nest trees and associated screen trees, unless they are a confirmed safety hazard per the guidance documents from the implementing agency or another agency with jurisdiction in the Action Area.
b. Avoid removing or damaging trees or snags with potential nesting platforms and associated screen trees. These include trees with large flattened tops, large broken topped trees, trees with decadence such as large cavities, mistletoe broom structures, cat faces, or large limbs; or large snags with these similar characteristics.

c. Avoid removing large (20" diameter at breast height or larger) snags, unless they are a confirmed safety hazard per the implementing agency's guidance documents.

NSO-7 Avoid Reducing Habitat Quality: Project activities will not downgrade or remove the function of suitable nesting/roosting habitat to the degree that the habitat does not function in the capacity that existed pre-treatment:

a. While habitat elements may be removed, such as individual large trees or snags if they are a confirmed safety hazard, from nesting/roosting habitat, the treatment must not be so extensive as to downgrade or remove the overall function of the habitat.
b. If the Subapplicant's proposed project removes or downgrade nesting/roosting habitat function, this programmatic biological opinion is not applicable and a separate consultation with the Service is warranted.

NSO-8 Avoid Foraging Habitat: Within suitable foraging habitat in NSO core areas (0.5 mile radius, or 500-acre area, around an Activity Center) and within suitable foraging habitat in NSO home ranges (1.3 mile radius, including core, or 3,398-acre area around an Activity Center):

a. Avoid downgrading or removing suitable foraging habitat function.
b. While habitat elements may be removed, such as individual trees, shrubs, down logs and snags, from foraging habitat, the treatment must not be so extensive as to downgrade or remove the overall function of the habitat in an NSO core or home range below the recommended habitat levels for supporting survival, reproduction and occupancy (USDI-FWS 2009). This level is a combination of 400 acres of suitable NRF habitat in the core. For the home range, the level is 40 percent suitable NRF (approximately 1,336 acres).
c. If the Subapplicant's proposed project removes or downgrades suitable foraging habitat function in a core and home range to below the recommended levels, this programmatic biological opinion is not applicable and a separate consultation with the Service is warranted.

NSO-9 Work Restrictions in NSO Critical Habitat: When working in designated critical habitat, adhere to all measures described in NSO-6, NSO-7, and NSO-8 for reducing impacts in suitable nesting/roosting and foraging habitat. This will assure that effects to Physical and Biological Features (PBFs) of PBF-2 (nesting/roosting) and PBF-3 (foraging) are insignificant and discountable. Adhering to these Conservation Measures (NSO-6, NSO-7, and NSO-8 above) will also assure that effects to PBF-1 and PBF-4 are insignificant and discountable, given the larger scale at which effects to these critical habitat PBFs are to be considered under the 2012 Revised Critical Habitat final rule (77 FR 71876). PBF-1 refers to forest types that may be in early, mid, or late seral stages and that support the NSO across its geographical range. PBF-4 refers to habitat that supports the transience and colonization phases of dispersal.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." For the proposed project, the Action Area encompasses the entire jurisdiction of the Sacramento Fish and Wildlife Office, which encompasses all or parts of 40 counties.
(https://www.fws.gov/sacramento/GIS_resources/Maps/Images/sacramento_jurisdiction.jpg)

Analytical Framework for the Jeopardy Determinations

Section 7(a)(2) of the Endangered Species Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

The jeopardy analysis in this programmatic biological opinion considers the effects of the proposed federal action, and any cumulative effects, on the range wide survival and recovery of the listed species. It relies on four components: (1) the Status of the Species, which describes the range-wide condition of the species, the factors responsible for that condition, and its survival and recovery needs; (2) the Environmental Baseline, which analyzes the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) the Effects of the Action, which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the species; and (4) the Cumulative Effects, which evaluates the effects of future, non-federal activities in the action area on the species.

In accordance with the implementing regulations for Section 7 and Service policy, the jeopardy determination is made in the following manner: the effects of the proposed federal action are evaluated in the context of the aggregate effects of all factors that have contributed to the current status of 42 species. Additionally, for non-Federal activities in the action area, we will evaluate those actions likely to affect the species in the future, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both its survival and recovery in the wild.

The following analysis places an emphasis on using the range-wide survival and recovery needs of the these species, and the role of the action area in providing for those needs as the context for evaluating the significance of the effects of the proposed programmatic Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Analytical Framework Adverse Modification

Section 7(a)(2) of the Act requires that federal agencies insure that any action they authorize, fund, or carry out is not likely to destroy or adversely modify designated critical habitat. A final rule revising the regulatory definition of "destruction or adverse modification" (DAM) was published on February 11, 2016 (81 FR 7214). The final rule became effective on March 14, 2016. The revised definition states:

> "Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features."

The DAM analysis in this biological opinion relies on four components: (1) the Status of Critical Habitat, which describes the range-wide condition of the critical habitat in terms of the key components (i.e., essential habitat features, primary constituent elements, or physical and biological

features) that provide for the conservation of the listed species, the factors responsible for that condition, and the intended value of the critical habitat overall for the conservation/recovery of the listed species; (2) the Environmental Baseline, which analyzes the condition of the critical habitat in the action area, the factors responsible for that condition, and the value of the critical habitat in the action area for the conservation/recovery of the listed species; (3) the Effects of the Action, which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated and interdependent activities on the key components of critical habitat that provide for the conservation of the listed species, and how those impacts are likely to influence the conservation value of the affected critical habitat; and (4) Cumulative Effects, which evaluate the effects of future non-federal activities that are reasonably certain to occur in the action area on the key components of critical habitat that provide for the conservation of the listed species and how those impacts are likely to influence the conservation value of the affected critical habitat.

For purposes of making the DAM determination, the Service evaluates if the effects of the proposed federal action, taken together with cumulative effects, are likely to impair or preclude the capacity of critical habitat in the action area to serve its intended conservation function to an extent that appreciably diminishes the range wide value of critical habitat for the conservation of the listed species. The key to making that finding is understanding the value (i.e., the role) of the critical habitat in the action area for the conservation/recovery of the listed species based on the *Environmental Baseline* analysis.

Environmental Baseline and Status of the Species

Depending on the intensity of a disaster, it is possible for habitat areas directly impacted by disasters to be completely destroyed and landscapes to be severely altered. Additionally, during response and recovery efforts, areas outside of or undisturbed by a disaster may be affected due to the construction of new facilities, the relocation of existing facilities (e.g., schools or hospitals), or relocating the function of existing facilities. Therefore, the environmental baseline for the Action Area cannot be defined at this time.

California Red-Legged Frog

Listing Status

The California red-legged frog was listed as a threatened species on May 23, 1996 (Service 1996). Critical habitat was designated for this species on April 13, 2006 (Service 2006), with revisions to the critical habitat designation published on March 17, 2010 (Service 2010). At that time, the Service recognized the taxonomic change from *Rana aurora draytonii* to *Rana draytonii* (Shaffer et al. 2010). A recovery plan was published for the California red-legged frog on September 12, 2002 (Service 2002).

Description

The California red-legged frog is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 2003). The abdomen and hind legs of adults are largely red, while the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 2003); dorsolateral folds are prominent on the back. The California red-legged frog is sexually dimorphic; the females are larger than the males (Dodd 2013a, b). California red-legged frog tadpoles range from 0.6 inch to 3.1 inches in length and the

background color of the body is dark brown and yellow with darker spots (Storer 1925).

Current Status and Distribution

The historical range of the California red-legged frog extended from central Mendocino County and western Tehama County south in the California Coast Range to northern Baja California, Mexico, and in the Sierra Nevada/Cascade Ranges from Shasta County south to Madera County (Jennings and Hayes 1994). The species historically occurred from sea level to elevations of about 5,200 feet in 46 counties; however, currently the taxon is extant in 238 streams or drainages within only 22 counties, representing a loss of 70 percent of its former range (Service 2002). Isolated populations persist in several Sierra Nevada foothill locales and in Riverside County (Barry and Fellers 2013; Backlin et al. 2017; CDFW 2017; Gordon, R. and J. Bennett, pers. comm., 2017). The species is no longer considered extant in California's Central Valley due to significant declines caused by habitat modifications and exotic species (Fisher and Shaffer 1996). Currently, the California red-legged frog is widespread in the San Francisco Bay nine-county area (CDFW 2017). They are still locally abundant within the California coastal counties from Mendocino County to Los Angeles County and presumed extirpated in Orange and San Diego counties (CDFW 2017; Yang, D. and J. Martin, pers. comm., 2017; Gordon, R. and J. Bennett, pers. comm., 2017). Baja California represents the southernmost edge of the species' current range (Peralta-García et al. 2016).

Barry and Fellers (2013) conducted a comprehensive study to determine the current range of the California red-legged frog in the Sierra Nevada, concluding that it differs little from its historical range; however, the current Sierra Nevada populations appear to be small and tend to fluctuate. Since 1991, eleven California red-legged frog populations have been discovered or confirmed, including eight probable breeding populations (Barry and Fellers 2013; Mabe, J., pers. comm., 2017). Microsatellite and mitochondrial DNA analysis by Richmond et al. (2014) confirmed the Sierra Nevada populations of the California red-legged frog are genetically distinct from each other, as well as from other populations throughout the range of this species. The research concluded that the Sierra Nevada populations are persisting at low levels of genetic diversity and no contemporary gene flow across populations exist. On a larger geographic scale, range contraction has left a substantial gap between Sierra Nevada and Coast Range populations, similar to the gap separating the Southern California and Baja California populations (Richmond et al. 2014).

Habitat and Life History

Habitat: The California red-legged frog generally breeds in still or slow-moving water associated with emergent vegetation, such as cattails, tules (hardstem bulrush), or overhanging willows (Storer 1925; Fellers 2005). Aquatic breeding habitat predominantly includes permanent water sources such as streams, marshes, and natural and manmade ponds in valley bottoms and foothills (Jennings and Hayes 1994; Bulger et al. 2003; Stebbins 2003). Since the 1850's, manmade ponds may actually supplement stream pool breeding habit and can be capable of supporting large populations of this species. Breeding sites may hold water only seasonally, but sufficient water must persist at the beginning of the breeding season and into late summer or early fall for tadpoles to successfully complete metamorphosis. Breeding habitat does not include deep lacustrine water habitat (e.g., deep lakes and reservoirs 50 acres or larger in size) (Service 2010). Within the coastal lagoon habitats, salinity is a significant factor on embryonic mortality or abnormalities (Jennings and Hayes 1990). Jennings and Hayes (1990) conducted laboratory studies and field observations concluding salinity levels above 4.5 parts per thousand detrimentally affected the California red-legged frog embryos. Aquatic breeding habitat does not need to be available every year, but it must be available at least once within the frog's lifespan for breeding to occur (Service 2010).

Non-breeding aquatic habitat consists of shallow (non-lacustrine) freshwater features not suitable as breeding habitat, such as seasonal streams, small seeps, springs, and ponds that dry too quickly to support breeding. Non-breeding aquatic and riparian habitat is essential for providing the space, food, and cover necessary to sustain the California red-legged frog. Riparian habitat consists of vegetation growing nearby, but not typically in, a body of water on which it depends, and usually extends from the bank of a pond or stream to the margins of the associated floodplain (Service 2010). Adult California red-legged frogs may avoid coastal habitat with salinity levels greater than 6.5 parts per thousand (Jennings and Hayes 1990).

Cover and refugia are important habitat characteristic preferences for the species (Halstead and Kleeman 2017). Refugia may include vegetation, organic debris, animal burrows, boulders, rocks, logjams, industrial debris, or any other object that provides cover. Agricultural features such as watering troughs, spring boxes, abandoned sheds, or haystacks may also be utilized by the species. Incised stream channels with portions narrower and depths greater than 18 inches may also provide important summer sheltering habitat. During periods of high water flow, California red-legged frogs are rarely observed; individuals may seek refuge from high flows in pockets or small mammal burrows beneath banks stabilized by shrubby riparian growth (Jennings and Hayes 1994). Accessibility to cover habitat is essential for the survival of California red-legged frogs within a watershed and can be a factor limiting frog population numbers and survival.

Breeding: The California red-legged frog typically breeds between November and April; however, breeding may occur later in the Sierra Nevada Range (Barry 2002). Females deposit their egg masses on emergent vegetation, floating on or near the surface of the water. The California red-legged frog is often a prolific breeder, laying eggs during or shortly after large rainfall events in late winter and early spring. Egg masses containing 300-4,000 eggs hatch after six to fourteen days (Storer 1925; Jennings and Hayes 1994; Fellers 2005). Historically, the California red-legged frog in the Sierra Nevada likely bred within stream pools, which tend to be small with limited forage, constraining the size and number of populations (Barry and Fellers 2013).

California red-legged frog tadpoles undergo metamorphosis three to seven months following hatching. Most males reach sexual maturity in two years, while it takes approximately three years for females (Jennings and Hayes 1985; Fellers 2005). Under favorable conditions, California red-legged frogs may live eight to ten years (Jennings et al. 1992). Of the various life stages, tadpoles likely experience the highest mortality rates; only one percent of each egg mass completes metamorphosis (Jennings et al. 1992).

Diet: The California red-legged frog has a variable diet that changes with each of its life history stages. The feeding habits of the early stages are likely similar to other ranids, whose tadpoles feed on algae, diatoms, and detritus by grazing on the surface of rocks and vegetation (Fellers 2005). Hayes and Tennant (1985) found invertebrates to be the most common food items of adult California red-legged frogs collected in southern California; however, they speculated that this was opportunistic and varied based on prey availability. Vertebrates, such as Pacific tree frogs (*Hyla regilla*) and California mice (*Peromyscus californicus*), represented over half of the prey mass eaten by larger frogs, although invertebrates were the most numerous food items. Feeding typically occurs along the shoreline and on the surface of the water; juveniles appear to forage during both daytime and nighttime, whereas adults appear to feed at night (Hayes and Tennant 1985).

Movement: California red-legged frogs do not have a distinct breeding migration (Fellers 2005), rather they may move seasonally from non-breeding pools or refugia to breeding pools. Some individuals

remain at breeding sites year-round while others disperse to neighboring water features or moist upland sites when breeding is complete and/or when breeding pools dry (Service 2002; Bulger et al. 2003; Fellers and Kleeman 2007; Tatarian and Tatarian 2008; Tatarian 2008). Studies in the several San Francisco Bay counties showed movements are typically along riparian corridors (Fellers and Kleeman 2007; Tatarian 2008). Although, some individuals, especially on rainy nights and in more mesic areas, travel without apparent regard to topography, vegetation type, or riparian corridors, and can move directly from one site to another through normally inhospitable habitats such as heavily grazed pastures or oak-grassland savannas (Bulger et al 2003).

California red-legged frogs show high site fidelity (Tatarian and Tatarian 2008) and typically do not move significant distances from breeding sites (Bulger et al. 2003; Fellers and Kleeman 2007; Tatarian and Tatarian 2008; Tatarian 2008). When traveling between aquatic sites, California red-legged frogs typically travel less than 0.31 miles (Fellers and Kleeman 2007; Tatarian and Tatarian 2008), although they have been documented to move more than two miles in Santa Cruz County (Bulger et al. 2003). Various studies have found that the frogs typically do not make terrestrial forays further than 200 feet from aquatic habitat (Bulger et al. 2003; Fellers and Kleeman 2007; Tatarian and Tatarian 2008; Tatarian 2008). Upland movements are typically associated with precipitation events and usually last for one to four days (Tatarian 2008).

Threats

Factors associated with declining populations of the California red-legged frog throughout its range include degradation and loss of habitat through agriculture, urbanization, mining, overgrazing, recreation, timber harvesting, non-native species, impoundments, water diversions, erosion and siltation altering upland and aquatic habitat, degraded water quality, use of pesticides, and introduced predators (Service 2002, 2010). Urbanization often leaves isolated habitat fragments and creates barriers to frog dispersal.

Non-native species pose a major threat to the recovery of California red-legged frogs. Several researchers have noted the decline and eventual local disappearance of California and northern red-legged frogs in systems supporting bullfrogs (Jennings and Hayes 1990; Twedt 1993), red swamp crayfish, signal crayfish, and several species of warm water fish including sunfish, goldfish, common carp, and mosquitofish (Moyle 1976; Barry 1992; Hunt 1993; Fisher and Shaffer 1996). The decline of the California red-legged frog due to these non-native species has been attributed to predation, competition, and reproduction interference (Twedt 1993; Bury and Whelan 1984; Storer 1933; Emlen 1977; Kruse and Francis 1977; Jennings and Hays 1990; Jennings 1993).

Chytridiomycosis, an infectious disease caused by the chytrid fungus, *Batrachochytrium dendrobatidis* (*Bd*), has been found to adversely affect amphibians globally (Davidson et al. 2003; Lips et al. 2006). While *Bd* prevalence in wild amphibian populations in California is unknown (Fellers et al. 2011), chytrid is expected to be widespread throughout much of the California red-legged frog's range. The chytrid fungus has been documented within the California red-legged frog populations at Point Reyes National Seashore, two properties in Santa Clara County, Yosemite National Park, Hughes Pond, Sailor Flat, Big Gun Diggings, and Spivey Pond (Padgett-Flohr and Hopkins 2010; Tatarian and Tatarian 2010; Fellers et al. 2011; Barry and Fellers 2013). However, no chytrid-related mortality has been reported in these populations, suggesting that California red-legged frogs are less vulnerable to the pathogenic effects of chytrid infection than other amphibian species (Tatarian and Tatarian 2010; Barry and Fellers 2013; Fellers et al. 2017). While chytrid infection may not directly lead to mortality in California red-legged frogs, Padgett-Flohr (2008) states that this infection may reduce overall fitness and could lead to long-term effects. Therefore, it is difficult to estimate the

full extent and risk of chytridiomycosis to the California red-legged frog populations.

Recovery Plan

The Recovery Plan for the California red-legged frog identifies eight recovery units (Service 2002). Based on various regional areas of the species' range, the establishment of these recovery units are essential to its survival and recovery. The goal of the recovery plan is to protect the long-term viability of all extant populations within each recovery unit. Within each recovery unit, delineated core areas, designed to protect metapopulations, represent contiguous areas of moderate to high California red-legged frog densities. The management strategy identified within this Recovery Plan will allow for the recolonization of habitats within and adjacent to core areas naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of California red-legged frogs.

Critical Habitat

The Service designated critical habitat for the California red-legged frog on March 13, 2001 (Service 2001a) and a revised designation to the critical habitat was published on April 13, 2006 (Service 2006b) and again on March 17, 2010 (Service 2010). At this time, the Service recognized the taxonomic change from *Rana aurora draytonii* to *Rana draytonii* (Shaffer *et al.* 2010). The rule identifies approximately 1,636,609 acres within 48 critical habitat units in Alameda, Butte, Calaveras, Contra Costa, El Dorado, Kern, Kings, Los Angeles, Marin, Mendocino, Merced, Monterey, Napa, Nevada, Placer, San Benito, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Cruz, Solano, Sonoma, Stanislaus, Ventura, and Yuba Counties, California.

The physical and biological features (PBFs) defined for the California red-legged frog were derived from its biological needs. The area designated as revised critical habitat provides aquatic habitat for breeding and non-breeding activities and upland habitat for shelter, foraging, predator avoidance, and dispersal across its range. The PBFs and, therefore, the resulting physical and biological features essential for the conservation of the species were determined from studies of California red-legged frog ecology. Based on the above needs and our current knowledge of the life history, biology, and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, the Service determined that the PBFs essential to the conservation of the California red-legged frog are:

> PBF 1 Aquatic Breeding: Habitat Standing bodies of fresh water (with salinities less than 7.0 parts per thousand), including: natural and manmade (e.g., stock) ponds, slow-moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years;
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> PBF 2 Non-Breeding Aquatic Habitat: Freshwater and wetted riparian habitats, as described above, that may not hold water long enough for the subspecies to hatch and complete its aquatic life cycle but that do provide for shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult California red-legged frogs. Other wetland habitats considered to meet these elements include, but are not limited to: plunge pools within intermittent creeks; seeps; quiet water refugia during high water flows; and springs of sufficient flow to withstand the summer dry period.

PBF 3 Upland Habitat: Upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of one mile in most cases and comprised of various vegetation series such as grasslands, woodlands, wetland, or riparian plant species that provide the frog shelter, forage, and predator avoidance. Upland features are also essential in that they are needed to maintain the hydrologic, geographic, topographic, ecological, and edaphic features that support and surround the wetland or riparian habitat. These upland features contribute to the filling and drying of the wetland or riparian habitat and are responsible for maintaining suitable periods of pool inundation for larval frogs and their food sources, and provide breeding, non-breeding, feeding, and sheltering habitat for juvenile and adult frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator avoidance). Upland habitat should include structural features such as boulders, rocks and organic debris (e.g., downed trees, logs), as well as small mammal burrows and moist leaf litter; and

PBF 4: Dispersal Habitat: Accessible upland or riparian dispersal habitat within designated units and between occupied locations within a minimum of 1 mile of each other that allow for movement between such sites. Dispersal habitat includes various natural habitats and altered habitats such as agricultural fields, which do not contain barriers (e.g., heavily traveled road without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large reservoirs over 50 acres in size, or other areas that do not contain those features identified in PBFs 1, 2, or 3 as essential to the conservation of the subspecies.

With the revised designation of critical habitat, the Service intends to conserve the geographic areas containing the physical and biological features that are essential to the conservation of the species, through the identification of the appropriate quantity and spatial arrangement of the PBFs sufficient to support the life-history functions of the species.

Based on the documented presence of this species in the Action Area, and the biology and ecology of this species, the Service has determined that the California red-legged frog is likely to be present in the Action Area and use this area for breeding, sheltering, foraging, and dispersal.

California Tiger Salamander Central Distinct Population Segment

The central California tiger salamander occurs or has the potential to occur within the Action Area in Alameda, Amador, Calaveras, Contra Costa, Fresno, Kern, Kings, Madera, Mariposa, Merced, Monterey, Sacramento, San Benito, San Mateo, San Joaquin, San Luis Obispo, Santa Clara, Santa Cruz, Stanislaus, Solano, Tulare, Tuolumne, and Yolo Counties (Service 2017b). The CNDDB (2018) lists 1,177 occurrences throughout its range. The central California tiger salamander occurs at sites on the Central Valley floor near sea level, up to a maximum elevation of roughly 3,940 feet (1,200 meters) in the Coast Ranges and 1,640 feet (500 meters) in the Sierra Nevada foothills Shaffer et al. 2013). Central California tiger salamanders are adapted to breeding in natural vernal pools and ponds; however, they now frequently use livestock ponds and other modified ephemeral and permanent ponds (Service 2014a). Upland habitats surrounding known central California tiger salamander breeding pools are usually dominated by grassland, oak savanna, or oak woodland (CNDDB 2015). The species requires upland habitat that is occupied by small burrowing mammals such as California ground squirrel (*Otospermophilus beecheyi*) and Botta's pocket gopher (*Thommomys bottae*) that create underground burrow systems used by the salamanders throughout the year (Shaffer et al. 1993; Seymour and Westphal 1994; Loredo et al. 1996; Pittman 2005). Large tracts of upland habitat, preferably with multiple breeding ponds, are necessary for the Central California tiger salamander to persist.

Multiple factors have contributed to population declines of the central California tiger salamander, including habitat loss and fragmentation due to agriculture and urbanization; predation from and competition with invasive species; hybridization with non-native barred tiger salamanders (*Ambystoma tigrinum*) (sometimes referred to as *Ambystoma tigrinum mavortium*) (Fitzpatrick and Shaffer 2004; Riley *et al.* 2003); mortality from road crossings; contaminants; and small mammal burrow control efforts (Service 2004, 2014a). Other threats include disease, predation, interspecific competition, exposure to contaminants, and rodent and mosquito control (Service 2004, 2014a).

The Recovery Plan for the Central California tiger salamander (Service 2017a) identifies four recovery units: Central Valley, Southern San Joaquin Valley, Bay Area and Central Coast Range. The Action Area includes all recovery units and occurrences. While there have been continued losses of central California tiger salamander habitat, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. For the most recent comprehensive assessment of the species' range-wide status, please refer to the Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*) (Service 2017a).

Critical Habitat

The Service designated critical habitat for the Central California tiger salamander on September 22, 2005 (Service 2005b). The rule identifies approximately 199,109 acres within 32 critical habitat units in Alameda, Amador, Calaveras, Contra Costa, Fresno, Kern, Kings, Madera, Mariposa, Merced, Monterey, Sacramento, San Benito, San Joaquin, San Luis Obispo, Santa Clara, Solano, Stanislaus, Tulare, and Yolo Counties, California.

The PBFs defined for the Central California tiger salamander were derived from its biological needs. The area designated as revised critical habitat provides aquatic habitat for breeding and non-breeding activities and upland habitat for shelter, foraging, predator avoidance, and dispersal across its range. The PBFs and, therefore, the resulting physical and biological features essential for the conservation of the species were determined from studies of California tiger salamander ecology. Based on the above needs and our current knowledge of the life history, biology, and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, the Service determined that the PBFs essential to the conservation of the Central California tiger salamander are:

> PBF 1 Aquatic Breeding Habitat: Standing bodies of fresh water (including natural and manmade (e.g., stock)) ponds, vernal pools, and other ephemeral or permanent water bodies which typically support inundation during winter rains and hold water for a minimum of 12 weeks in a year of average rainfall;
>
> PBF 2 Upland Habitat Upland: habitats adjacent and accessible to and from breeding ponds that contain small mammal burrows or other underground habitat that Central California tiger salamanders depend upon for food, shelter, and protection from the elements and predation; and
>
> PBF 3 Dispersal Habitat: Accessible upland dispersal habitat between occupied locations that allow for movement between such sites.

Based on occurrence records, the presence of suitable habitat, and the biology and ecology of the species, the Service has determined that the central California tiger salamander occurs within the Action Area.

California Tiger Salamander Sonoma Distinct Population Segment

The Sonoma California tiger salamander occurs or has the potential to occur within the Action Area, in Sonoma County. The CNDDB (2018) lists 81 currently known occurrences within Sonoma County. The Sonoma County California tiger salamander inhabits vernal pools and seasonal ponds, associated grassland, and oak savannah plant communities below 200 feet (60 meters) (Service 2003a). They also use modified ephemeral or permanent ponds and manmade features such as constructed ponds or livestock ponds (Service 2016). Sonoma County California tiger salamanders spend the majority of their lives underground in small mammal burrows in uplands, while ephemeral ponds play a critical role because they are necessary for breeding. As with the Central California tiger salamander, large tracts of upland habitat, preferably with multiple breeding ponds, are necessary for the Sonoma tiger salamander to persist (Service 2016).

The primary threats the Sonoma County California tiger salamander are the modification and destruction of suitable habitat due to urbanization, agricultural conversion, and competition with non-native plants. In addition to habitat loss, the fragmented condition of remaining Sonoma County California tiger salamander habitat restricts migration between aquatic breeding sites and upland non-breeding habitat, along with dispersal among aquatic breeding sites (Cook *et al.* 2005). Since 1991, these threats have continued to such an extent that many populations appear to have been extirpated or severely reduced in numbers.

The Recovery Plan for the Santa Rosa Plains (Service 2016) identifies three core areas for the Sonoma County California tiger salamander (Wright-Kelly Core Area, Llano Crescent-Stony Point Core Area, and West Cotati Core Area) and four bounded management areas (the Alton Lane, Horn-Hunter, Americano-Stemple, and East Cotati Management Areas). The Action Area includes all occurrences and core areas. While there have been continued losses of Central California tiger salamander habitat, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. For the most recent comprehensive assessment of the range-wide status of this plant species, please refer to the Recovery Plan for the Santa Rosa Plains (Service 2016).

Critical Habitat

The Service designated critical habitat for the Sonoma California tiger salamander on December 14, 2005 (Service 2005c) and a revised designation to the critical habitat was published on August 31, 2011 (Service 2011a). The rule identifies approximately 47,383 acres within one critical habitat unit in Sonoma County, California.

Based on the above needs and our current knowledge of the life history, biology, and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, the Service determined that the following PBFs are essential to the conservation of the Sonoma County California tiger salamander:

> PBF 1 Aquatic Breeding Habitat: standing bodies of fresh water (including natural and manmade (e.g., stock) ponds, vernal pools and other ephemeral or permanent water bodies that typically support inundation during winter/early spring and hold water for a minimum of 12

consecutive weeks in a year of average rainfall);

PBF 2 Upland Habitat: upland habitats adjacent and accessible to and from breeding ponds that contain small mammal burrows or other underground refugia that Sonoma County California tiger salamanders depend upon for food, shelter, and protection from the elements and predation; and

PBF 3 Dispersal Habitat: accessible upland dispersal habitat between occupied locations that allow for movement between such sites.

Based on occurrence records, the presence of suitable habitat, and the biology and ecology of the species, the Service has determined that the Sonoma California tiger salamander occurs within the Action Area.

Giant Garter Snake

The giant garter snake occurs or has the potential to occur within the Action Area in Sacramento and San Joaquin Valleys. The giant garter snake is endemic to the wetlands of the Sacramento and San Joaquin Valleys of California. The CNDDB (2018) lists 366 occurrences of the species in Amador, Butte, Colusa, Contra Costa, Fresno, Glenn, Kern, Madera, Merced, Sacramento, San Joaquin, Solano, Sutter, Yolo, and Yuba Counties. The giant garter snake now inhabits the remaining high-quality fragmented wetlands that include marshes, ponds, small lakes, low-gradient streams with silt substrates, and managed waterways (Service 2017a). Giant garter snakes typically occur in or adjacent to aquatic habitats possessing protective emergent vegetative cover that allow for foraging. Upland areas are also an important habitat component; the giant garter snake spends half of the year, roughly November through April, hibernating in uplands. The snake also is known to spend more than half the time in terrestrial environments during the active period during summer (Halstead et al. 2015b). While in such terrestrial habitats in summer, the snake is often underground, especially during extreme temperatures. Animal burrows are considered an important component of upland refugia, although other elements such as brush piles and even riprap may be used (e.g., Wylie and Amarello 2008). Although snakes can venture as much as 500 feet or more from the water edge, the overwhelming majority of both the summer and winter upland captures are within the first 10 meters from the water edge.

Threats to giant garter snake include habitat loss from urbanization, the subsequent fragmentation and population isolation, flood channel maintenance, agricultural practices (e.g., rice fallowing due to drought conditions, habitat disturbance and loss from irrigation and drainage ditch maintenance), climate change, water transfers, and invasive species. Habitat fragmentation restricts dispersal and isolates giant garter snake populations, increasing the likelihood of inbreeding, decreasing fitness, and reducing genetic diversity. These factors have ultimately resulted in the snake's extirpation from the southern one-third of its range in former wetlands associated with the historical Buena Vista, Tulare, and Kern lakebeds. In addition to habitat loss, the remaining Central Valley populations of the giant garter snake are subject to the cumulative effects of a number of other existing and potential threats, including roads and vehicular traffic, climate change, and predation by non-native species.

The Recovery Plan (Service 2017a) for the giant garter snake identifies nine recovery units that correspond directly to the nine geographically and genetically distinct populations: Butte Basin, Colusa Basin, Sutter Basin, American Basin, Yolo Basin, Delta Basin, Cosumnes-Mokelumne Basin, San Joaquin Basin, and Tulare Basin. The Action Area includes all recovery units and occurrences.

While there have been continued losses of giant garter snake habitat throughout the various recovery units, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. For the most recent comprehensive assessment of the species' range-wide status, please refer to the Recovery Plan for the Giant Garter Snake *(Thamnophis gigas)* (Service 2017a).

Critical Habitat

Critical habitat has not been designated for the giant garter snake.

Based on occurrence records, the presence of suitable habitat, and the biology and ecology of the species, the Service has determined that the giant garter snake occurs within the Action Area.

Alameda Whipsnake

The Alameda whipsnake occurs or has the potential to occur within the Action Area in Alameda, Contra Costa, western San Joaquin, northern Santa Clara, and northwestern Stanislaus Counties. The CNDDB (2018) lists 164 occurrences for Alameda whipsnake, the majority of which are in the Mount Diablo State Park and Los Vaqueros Watershed specifically, and on various East Bay Regional Park land. The current distribution is five populations within a fragmented regional metapopulation (Service 2002b). General habitat types of Alameda whipsnake include chaparral and coastal scrub, and associated native vegetation and rock land up to 500 feet (150 meters) from chaparral and coastal scrub (Service 2011e). While the Alameda whipsnake uses all slope aspects and brush community canopy closures, Swaim (1994) found areas of concentrated use on southwest-, south-, southeast-, east-, or northeast-facing slopes at both the Tilden Regional Park and the Moller Ranch.

Habitat loss and fragmentation are the primary threats to the Alameda whipsnake. Habitat loss and fragmentation from urban development, associated impacts due to increased population densities and associated highway and road construction likely has prevented or severely reduced movement of individuals between areas of suitable habitat, and exacerbated impacts of other threats. Urban development has also reduced the total amount of suitable habitat available for the Alameda whipsnake. Other current threats to the habitat of the Alameda whipsnake are incompatible grazing practices; spread of nonnative plants; increased predation from native and nonnative predators associated with urbanization; unauthorized collection; and alteration of suitable habitat from fire suppression, which creates closed-canopy habitat and increases fire severity.

The Draft Recovery Plan for the Alameda whipsnake (Service 2002b) identifies seven Recovery Units: Unit 1 (Tilden-Briones), Unit 2 (Oakland-Las Trampas), Unit 3 (Hayward-Pleasanton Ridge), Unit 4 (Mount Diablo-Black Hills), Unit 5 (Sunol-Cedar Mountain), Unit 6 (Caldecott Tunnel Corridor) and Unit 7 (Niles Canyon/Sunol Corridor). The Action Area includes all recovery units and occurrences. While there have been continued losses of Alameda whipsnake habitat throughout the various recovery units, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. For the most recent comprehensive assessment of the species' range-wide status, please refer to the Alameda Whipsnake (*Masticophis lateralis euryxanthus*) 5-year Review: Summary and Evaluation (Service 2011e). No change in the species' listing status was recommended in this species' 5-year review.

Critical Habitat

On October 2, 2006, the Service published the final rule determining critical habitat for the Alameda whipsnake in the Federal Register (Service 2006c). The rule designates approximately 154,834 acres within six critical habitat units in Alameda, Contra Costa, Santa Clara, and San Joaquin counties, California.

Based on our current knowledge of the life history, biology, and ecology of the Alameda whipsnake and the requirements of the habitat necessary to sustain the essential life history functions of the subspecies, the Service has determined that the PBFs for the Alameda whipsnake are:

> PBF 1: Scrub/shrub communities with a mosaic of open and closed canopy. Scrub/shrub vegetation dominated by low-to medium-stature woody shrubs with a mosaic of open and closed canopy as characterized by the chamise, chamise-eastwood manzanita, chaparral whitethorn, and interior live oak shrub vegetation series (as identified in the Manual of California Vegetation (Sawyer and Keeler-Wolf 1995), A Guide to Wildlife Habitats of California (Mayer and Laudenslayer 1988), and California Wildlife Habitat Relationship System (CDFG 1998)), occurring at elevations from sea level to approximately 3,850 feet. Such scrub/ shrub vegetation within these series forms a pattern of open and closed canopy used by the Alameda whipsnake for shelter from predators; temperature regulation because it provides sunny and shady locations; prey-viewing opportunities; and nesting habitat and substrate. These features contribute to support a prey base consisting of western fence lizards and other prey species such as skinks, frogs, snakes, and buds;
>
> PBF 2: Woodland or annual grassland plant communities contiguous to lands that contain PBF 1. Woodland or annual grassland vegetation series comprised of one or more of the following: blue oak, coast live oak, California bay, California buckeye, and California annual grassland vegetation series (as identified in the Manual of California Vegetation (Sawyer and Keeler-Wolf 1995), A Guide to Wildlife Habitats of California ((Mayer and Laudenslayer 1988), and California Wildlife Habitat Relationship System (CDFG 1998)) are PBF 2. This mosaic of vegetation is essential to the conservation of the Alameda whipsnake because it supports a prey base, consisting of western fence lizards and other prey species such as skinks, frogs, snakes, and buds. This provides opportunities for foraging by allowing snakes to come in contact with and visualize, track, and capture prey (especially western fence lizards along with other prey such as skinks, frogs, buds); short and long distance dispersal within, between, or to adjacent areas containing essential features (i.e., PBF 1 or PBF 3); and contact with other Alameda whipsnakes for mating and reproduction; and
>
> PBF 3: Lands containing rock outcrops, talus, and small mammal burrows within or adjacent to PBF 1 and or PBF 2. These areas are essential to the conservation of the Alameda whipsnake because they are used for retreats (shelter), hibernacula, foraging and dispersal, and provide additional prey population support functions. Refer to the final designation of critical habitat for additional information.

Based on occurrence records, the presence of suitable habitat, and the biology and ecology of the species, the Service has determined that the Alameda whipsnake occurs within the Action Area.

Least Bell's Vireo

The least Bell's vireo occurs or has the potential to occur within the Action Area in Sacramento, San Joaquin, Santa Clara, Tulare, Kern, Inyo, Yolo and Stanislaus Counties. The CNDDB (2018) lists 483 occurrences for the species. Least Bell's vireos are obligate riparian breeders, inhabiting structurally diverse woodlands along watercourses. They occur in a diversity of riparian habitat types including cottonwood-willow woodlands/forests, oaks woodlands, and mule fat scrub. (Service 1998d).

Threats to the least Bell's vireo include riparian habitat loss from agricultural, urban, and commercial developments, flood control and river channelization projects, livestock grazing and other activities, which have severely restricted the species' range and fragmented remaining habitat. Because of widespread riparian habitat losses, remaining breeding birds are segregated into small, disjunct and widely dispersed remnant populations, making them more vulnerable to extirpation than larger populations are (Franzreb 1989). When local habitats are lost and no nearby habitat is available for dispersal until damaged riparian habitat regenerates, vireos may be forced into habitats less suitable to their nesting and foraging requirements. This could resulting in increased mortality, reduced reproductive success, and declining population numbers (Franzreb 1989). Vireos also suffer from limited reproductive success as the result of nest parasitism by the brown-headed cowbird *(Molothrus ater),* which combined with habitat loss has resulted in a decline in the overall vireo population to about 300 breeding pairs.

The Draft Recovery Plan for the least Bell's vireo (Service 1998d) does not identify Recovery Units. However, it identifies population/metapopulation units needed for recovery. These include the San Joaquin Valley and the Sacramento Valley. The Action Area includes all occurrences and units. For the most recent comprehensive assessment of the species' range-wide status, please refer to the Least Bell's Vireo (*Vireo bellii pusillus*) 5-year Review: Summary and Evaluation (Service 2006d). No change in the species' listing status was recommended in this species' 5-year review.

Critical Habitat

The Service designated critical habitat for the least Bell's vireo on February 2, 1994 (Service 1994). This rule identifies 38,000 acres within 10 critical habitat units in Los Angeles, Riverside, San Bernardino, San Diego, Santa Barbara, and Ventura Counties, California. No units are within the Action Area for the Sacramento Fish and Wildlife Office.

The PBFs of critical habitat for the least Bell's vireo are the riverine and floodplain habitats (particularly willow-dominated riparian woodland with dense understory vegetation maintained, in part, in a non-climax stage by periodic floods or other agents) and adjacent coastal sage scrub, chaparral, or other upland plant communities. Vireos meet their survival and reproductive needs (food, cover, nest sites, and nestling and fledgling protection) within the riparian zone in most areas. In some areas they also forage in adjacent upland habitats.

Based on occurrence records, the presence of suitable habitat, and the biology and ecology of the species, the Service has determined that the least Bell's vireo occurs within the Action Area.

Tidewater Goby

The tidewater goby *(Eucyclogobius newberryi*), occurs within the Action Area in Sonoma, Marin, Alameda, Contra Costa, San Francisco and San Mateo Counties. The CNDDB (2018) lists 127

occurrences. The geographic range of the tidewater goby is limited to the coast of California (Eschmeyer *et al.* 1983, p. 262; Swift *et al.* 1989, p. 12) where it inhabits discrete locations of brackish water along the California coast. Tidewater goby localities closely correspond to major stream drainages (Swift et al. 1989; Habel and Armstrong 1977) where they generally select habitat in the upper estuary, usually within the fresh-saltwater interface. Tidewater gobies range upstream a short distance into fresh water, and downstream into water of up to about 75 percent sea water (28 parts per thousand). The species is typically found in salinities of less than 12 parts per thousand (Swift et al. 1989). These conditions occur in two relatively distinct situations: 1) the upper edge of tidal bays, such as Tomales, Bolinas, and San Francisco Bays near the entrance of freshwater tributaries and 2) the coastal lagoons formed at the mouths of coastal rivers, streams, or seasonally wet canyons.

Threats to the tidewater goby include loss of wetland and associated habitat due to development along the coast. These include wetland draining and filling for industrial and residential development; dredging to develop navigation channels, harbors, and marinas; hydrologic changes such as water diversion and related changes in salinity, groundwater overdrafting, channelization, and sand bar breaching (Service 2005d).

The Recovery Plan for the Tidewater Goby (Service 2005d) identifies one Recovery Unit, the Greater Bay Unit, within the Sacramento Fish and Wildlife Office jurisdiction. The Action Area includes all occurrences and this recovery unit. For the most recent comprehensive assessment of the species' range-wide status, please refer to the 12 month Finding and Proposed Rule to Reclassify the Tidewater Goby from Endangered to Threatened (Service 2014a).

Critical Habitat

The Service designated critical habitat for the tidewater goby on November 20, 2000 (Service 2000), and a revised designation to the critical habitat was published on January 31, 2008 (Service 2008a) and again on February 6, 2013 (Service 2013b). This rule identifies 12,156 acres of within 44 critical habitat units in Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego Counties, California. There is approximately 1,728 acres of designated critical habitat for the tidewater goby within the jurisdictional boundary of the Sacramento Fish and Wildlife Office.

Based on our current knowledge of the physical or biological features and habitat characteristics required to sustain the species' life-history processes, we determine that the physical and biological features (PBFs) specific to the tidewater goby are:

> PBF-1: Persistent, shallow (in the range of approximately 0.3 to 6.6 feet (0.1 to 2 meters)), still-to-slow-moving lagoons, estuaries, and coastal streams with salinity up to 12 parts per thousand, which provide adequate space for normal behavior and individual an population growth that contain one or more of the following:
>
> a. Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction;
> b. Submerged and emergent aquatic vegetation, such as *Potamogeton pectinatus*, *Ruppia maritima*, *Typha latifolia*, and *Scirpus* spp., that provides protection from predators and high flow events; or
> c. Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity.

Based on occurrence records, the presence of suitable habitat, and the biology and ecology of the species, the Service has determined that the tidewater goby occurs within the Action Area.

Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (VELB) *(Desmocerus californicus dimorphus*), occurs within the California Central Valley. The CNDDB (2018) lists 271 occurrences for this species. The species' range extends from approximately Shasta County south to Fresno County, including the valley floor and lower foothills. The majority of VELB are documented below 500 feet (152 meters) in elevation. VELB habitat includes both riparian and non-riparian areas where elderberry shrubs are present. They occur only in association with its host plant, elderberry (*Sambucus* ssp.).

The primary threat to VELB and its elderberry shrub host plant are the significant loss, degradation or modification of riparian and other natural habitats. The species is estimated to occupy only 16 to 21 percent of its historical range. The result is a rare, patchy distribution within the limited and fragmented riparian areas within the California Central Valley. Riparian habitat loss is associated with agriculture conversion, levee construction and maintenance and stream channelization, and the impacts associated with urbanization. Impacts to elderberry shrubs associated maintenance activities include pruning of elderberry shrub branches along levees, roadways, trails, and other areas to control visual obstructions, or for aesthetic reasons. Invasive nonnative plants may affect the species through competition for space and resources with its host plant (Service 2014c).

The recovery plan for VELB does not identify recovery units. However, the Action Area includes all known occurrences and habitat for the species. While there have been continued losses of VELB habitat throughout its range, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. For the most recent comprehensive assessment of the range-wide status of the beetle, please refer to the Withdrawal of the Proposed Rule to Remove the Valley Elderberry Longhorn Beetle from the Federal List of Endangered and Threatened Wildlife (Service 2014c).

Critical Habitat

On August 8, 1980, the final rule determining critical habitat for the valley elderberry longhorn beetle was published in the Federal Register on August 8, 1980 (Service 1980). Within the Action Area, the rule designates approximately 515 acres within two critical habitat units in Sacramento County, California. These designated areas of critical habitat are the American River Parkway Zone, an area along the lower American River at Goethe and Ancil Hoffman Parks, and the Sacramento Zone, an area located approximately one-half-mile from the American River downstream from the American River Parkway Zone. These critical habitat areas support large numbers of mature elderberry shrubs with extensive evidence of beetle use.

Based on occurrence records, the presence of suitable habitat, and the biology and ecology of the species, the Service has determined that the VELB occurs within the Action Area.

California Freshwater Shrimp

The California freshwater shrimp occurs or has the potential to occur within the Action Area in Marin, Napa, and Sonoma Counties. The CNDDB (2018) lists 20 occurrences for the California freshwater shrimp. At the time of the most recent 5-year review, California freshwater shrimp were

found in 23 streams: Atascadero Creek, Big Austin Creek, Blucher Creek, Bud Creek, Cheda Creek, East Austin Creek, Ebabias Creek, Fallon Creek, Franz Creek, Garnett Creek, Green Valley Creek, Huichica Creek and an unnamed tributary to Huichica Creek, Jonive Creek, Keys Creek, Lagunitas Creek, Napa River, Olema Creek, Redwood Creek, Salmon Creek, Sonoma Creek, Stemple Creek, Walker Creek, and Yulupa Creek (Service 2011c). CNDDB identifies one additional stream as having California freshwater shrimp: Hudspeth Creek. The California freshwater shrimp is found in low elevation (less than 116 meters, 380 feet), low gradient (generally less than 1 percent) perennial freshwater streams or intermittent streams with perennial pools where banks are structurally diverse with undercut banks, exposed roots, overhanging woody debris, or overhanging vegetation (Service 1998b).

Threats to the California freshwater shrimp and its habitat include agricultural activities, residential development, water pollution, water diversions, recreation activities (summer dams), chemicals, and channelization. Additional threats include gravel mining, water development, urban runoff, flood control, and bank protection (Service 2011c).

The Recovery Plan for the California Freshwater Shrimp (Service 1998b) does not have recovery units *per se*; however, it does identify four watersheds with known populations that require a watershed plan for down listing. These watersheds are the tributary streams in the lower Russian River drainage, coastal streams flowing directly into the Pacific Ocean, streams draining into Tomales Bay, and streams flowing into San Pablo Bay. The Action Area includes all occurrences. While there have been continued losses of California freshwater shrimp habitat throughout its range, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. For the most recent comprehensive assessment of the range-wide status, please refer to the California freshwater shrimp (*Syncaris pacifica*) 5-Year Review: Summary and Evaluation (Service 2011c). No change in the species' listing status was recommended in this species' 5-year review.

Critical Habitat

Critical habitat has not been designated for the California freshwater shrimp.

Based on occurrence records, the presence of suitable habitat, and the biology and ecology of the species, the Service has determined that the California freshwater shrimp occurs within the Action Area.

Bay Checkerspot Butterfly

The Bay checkerspot butterfly occurs or has the potential to occur within the Action Area in Santa Clara and San Mateo Counties. The CNDDB (2018) lists 19 occurrences for the Bay checkerspot butterfly. Currently, the species is largely restricted to grasslands with host plants on serpentine-like soils in Santa Clara and San Mateo Counties. It also occurs in non-serpentine annual grassland occupied by its host plants on San Bruno Mountain in San Mateo County, where it was extirpated until recently reintroduced to serpentine grasslands in Edgewood Park and non-serpentine annual grasslands at San Bruno Mountain. The primary larval host plant for the butterfly is a small, annual, native plantain (*Plantago erecta*) (Service 1998c). The butterfly also frequently requires the presence of a secondary host plant, either purple owl's-clover (*Castilleja densiflora*) or exserted paintbrush (*Castilleja exserta*) (Singer 1972, p. 76; Murphy and Ehrlich 1980, p. 316; Weiss 1999, p. 1478) since owl's clover and the paintbrush remain edible longer than the plantain.

The primary threats to the Bay checkerspot butterfly are habitat degradation and loss caused by non-native plants displacing or reducing native food plants, and urban and suburban development (Service 1998c). Habitat loss has reduced the number and size of extant Bay checkerspot butterfly populations. Smaller populations are more vulnerable to extinction. Loss of serpentine of habitats or reduction of these habitats to non-viable sizes has increased the distance between populations and making genetic exchange and recolonization more difficult (Service 1998c). Invasion of non-native species into native grasslands is also a major cause of decline, choking out native food and host plant species. Trampling associated with increased human activity also threatens eggs, larvae and adult butterflies. Hikers, bicyclists, and off-road vehicles can crush larvae. These activities may also harm food plants, indirectly decreasing larval survival. Other noted threats include illegal collection, inappropriate grazing practices, pesticide use and road kill.

The Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area (Service 1998c), which includes the Bay checkerspot butterfly, identifies five core areas: one on the San Francisco peninsula in San Mateo County (Edgewood County Park) and four in Santa Clara County (Coyote Ridge in Santa Clara County), as well as a number of satellite populations. The Action Area includes all occurrences and recovery areas. While there have been continued losses of Bay checkerspot butterfly habitat throughout the various recovery units, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. For the most recent comprehensive assessment of the range-wide status, please refer to the Bay Checkerspot Butterfly *(Euphydryas editha bayensis)* 5-Year Review: Summary and Evaluation (Service 2009a). No change in the species' listing status was recommended in this species' 5-year review.

Critical Habitat

The Service designated critical habitat for the Bay checkerspot butterfly on February 29, 2001 (Service 2001b) and a revised designation to the critical habitat was published on August 26, 2008 (Service 2008b). The rule identifies 18,293 acres within 13 critical habitat units in San Mateo and Santa Clara Counties, California. All of these acres and units are within the Sacramento Fish and Wildlife Office Action Area.

Within these units that are considered to be essential for the conservation and recovery of the Bay checkerspot butterfly, the Service has determined the following physical and biological features:

PBF 1: The presence of annual or perennial grasslands with little to no overstory that provide north-south and east-west slopes with a tilt of more than 7 degrees for larval host plant survival during periods of atypical weather (for example, drought). Common grassland species include wild oats (*Avena fatua*), soft chess (*Bromus hordeaeceus*), California oatgrass (*Danthonia californica*), Italian ryegrass (*Lolium multiflorum*), purple needlegrass (*Nassella pulchra*), and Idaho fescue (*Festuca idahoensis*); less abundant in these grasslands are annual and perennial forbs such as filaree (*Erodium botrys*), true clovers (*Trifolium* spp.), and dwarf plantain (*Plantago erecta*). These species, with the exception of the dwarf plantain, are not required by the Bay checkerspot butterfly, but merely are provided here as an example of species commonly found in California grasslands;

PBF 2: The presence of the primary larval host plant, dwarf plantain (*Plantago erecta*), and at least one of the secondary host plants, purple owl's-clover (*Castilleja densiflora*) or exserted paintbrush (*Castilleja exserta*), are required for reproduction, feeding, and larval development;

PBF 3: The presence of adult nectar sources for feeding. Common nectar sources include desert parsley (*Lomatium* spp.), California goldfields (*Lasthenia californica*), tidy-tips (*Layia platyglossa*), sea

muilla (*Muilla maritima*), scytheleaf onion (*Allium falcifolium*), flase babystars (*Linanthus androsaceus*), and intermediate fiddleneck (*Amsinckia intermedia*);

PBF 4: Soils derived from serpentinite ultramafic rock (Montara, Climara, Henneke, Hentine, and Obispo soil series) or similar soils (Inks, Candlestick, Los Gatos, Fagan, and Barnabe soil series) that provide areas with fewer aggressive, nonnative plant species for larval host plant and adult nectar plant survival and reproduction; and

PBF 5: The presence of stable holes and cracks in the soil, and surface rock outcrops that provide shelter for the larval stage of the Bay checkerspot butterfly during summer diapause.

Based on occurrence records, the presence of suitable habitat, and the biology and ecology of the species, the Service has determined that the Bay checkerspot butterfly occurs within the Action Area.

Callippe Silverspot Butterfly

The callippe silverspot butterfly occurs or has the potential to occur within the Action Area in San Mateo, Solano, Sonoma and Alameda Counties. The CNDDB (2018) lists 12 occurrences for the callippe silverspot butterfly. The species currently is known from isolated populations occurring in grasslands with its host plant in northern San Mateo County (San Bruno Mountain.), Solano County (Cordelia Hills), Sonoma County (Sears Point), Alameda County (hills near Pleasanton, watershed east of Calaveras Reservoir) (Terry, J, pers. comm., 2018). The habitat for the callippe silverspot butterfly is native grasslands and associated habitats in the San Francisco Bay area (Service 1997). These grasslands are associated with deep soils that have established grass cover and contain the larval host plant *Viola pedunculata* (Service 2009b).

The primary threats to the callippe silverspot butterfly include habitat loss and fragmentation resulting from urbanization throughout the greater San Francisco Bay area. As habitat has been lost and fragmented, the small populations have become increasingly isolated, eventually affecting dispersal and genetic exchange between populations (Service 1997). Invasion of non-native plants and shrubs is another significant threat to the callippe silverspot butterfly. Non-native species have displaced grassland habitats; invasive grasses and herbs displace callippe silverspot butterfly host plants and food plants, or make them difficult to access. Trampling by increased human activity also threatens this species. Hikers, bicyclists, and off-road vehicles can kill larvae. These activities may also harm food plant, indirectly decreasing larval survival (Service 2009b).

There is no recovery plan for this species. The Action Area includes all occurrences. While there have been continued losses of callippe silverspot butterfly habitat throughout its range, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. For the most recent comprehensive assessment of the range-wide status, please refer to the Callippe Silverspot Butterfly *(Speyeria callippe callippe)* 5-Year Review: Summary and Evaluation (Service 2009b). No change in the species' listing status was recommended in this species' 5-year review.

Critical Habitat

No critical habitat has been designated for the callippe silverspot butterfly.

Based on occurrence records, the presence of suitable habitat, and the biology and ecology of the species, the Service has determined that the callippe silverspot butterfly occurs within the Action Area.

Myrtle's Silverspot Butterfly

The Myrtle's silverspot butterfly occurs or has the potential to occur within the Action Area in Marin and Sonoma Counties. The CNDDB (2018) lists 17 occurrences for the Myrtle's silverspot butterfly. The species currently is known to occur up to 3 miles inland in Marin and Sonoma Counties: from Point Reyes in Marin County and north to the mouth of Russian River in Jenner in Sonoma County (Terry, J., pers. comm. 2018). The Myrtle's silverspot butterfly occurs in association with coastal dunes, coastal scrub and coastal prairies that are protected from winds (Launer *et al.* 1992). One of the critical factors in the distribution of the Myrtle's silverspot butterfly is the presence of its host plant, the western dog violet (*Viola adunca*) (Service 2009c).

Development is the primary threat to the Myrtle's silverspot butterfly, and development of the remaining habitat for this species will remain a threat until sufficient habitat for the species is acquired and protected. Increased human activity is also threat; foot traffic, cyclists and off-road vehicles pose hazards to the larval stages of the butterfly by inadvertently trampling their host plant (Service 1992).

The Recovery Plan for the Myrtle's silverspot butterfly does not identify recovery units; however, it does state that for downlisting, habitat in northwestern Marin and southwestern Sonoma counties must be protected in perpetuity (Service 1998a). The Action Area includes these key recovery areas and all occurrences. While there have been continued losses of Myrtle's silverspot butterfly habitat throughout its range, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. For the most recent comprehensive assessment of the range-wide status, please refer to the Myrtle's Silverspot Butterfly *(Speyeria zerene myrtleae)* 5-Year Review: Summary and Evaluation (Service 2009c). No change in the species' listing status was recommended in this species' 5-year review.

Critical Habitat

Critical habitat has not been designated for the Myrtle's silverspot butterfly.

Based on occurrence records, the presence of suitable habitat, and the biology and ecology of the species, the Service has determined that the Myrtle's silverspot butterfly occurs within the Action Area.

Vernal Pool Branchiopods

In California, primary vernal pool habitat forms a discontinuous ring around the margins of the California Central Valley. The majority of pools occur on the older alluvial terraces along the eastern margin of the valley, but vernal pool habitat also occurs on high terraces on the eastern sides of the inner Coast Ranges and an additional band through the valley center. Vernal pool complexes are typified by a range of aquatic habitats, although some locales have more pools of one type (e.g., small, shallow, and short-lived, or playa-type pools, etc.) than other areas (Holland 1998a). Several counties (Glenn, Colusa, and Yolo) have little potential habitat for the branchiopods because they lack substantial areas of hardpan soils and have little flat land that is not in agriculture. Tehama, Yuba, Solano, and Madera counties contain the highest-density areas of vernal pools, while

Sacramento, Merced, and Fresno counties have many areas with high-density pools. Of the 20 Central Valley counties, Yuba, Placer, Sacramento, and Madera counties have the highest average densities (Holland 1978). These areas of high-density habitat likely are especially important to the population dynamics of vernal pool branchiopods such as the vernal pool fairy. Up to 85 percent of vernal pools may lack large vernal pool branchiopods (Helm 1998). Holland (1998) estimated that extant vernal pool landscapes throughout the Central Valley had fallen below 1,000,000 acres, or roughly one quarter of the valley's estimated original vernal pool habitat.

In California's Central Coast Ranges, vernal pool habitats are more thinly distributed than in the Central Valley, with only 42,488 acres of vernal pool habitat occurring out of a total of 9,574,099 acres in the region (Holland 2003). Habitat patches are smaller and more isolated; however, loss of vernal pool habitat in this area also appears to be accelerating. Holland (2003) recorded a 2-3 percent annual loss rate between 1994 and 2000, and almost a 12 percent loss between 2000 and 2001, with the loss often due to agricultural conversion (to hay or vineyards).

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp occurs or has the potential to occur within the Action Area where its vernal pool habitat occurs. The CNDDB (2018) lists 766 occurrences for the vernal pool fairy shrimp. In California, the range of the species extends from disjunct locations in Riverside County and the Coast Ranges, north through Central Valley grasslands to Tehama County (Service 2007a). The vernal pool fairy shrimp is endemic to California where it exists only in ephemeral freshwater habitats, including alkaline pools, clay flats, vernal lakes, vernal pools, vernal swales, and other seasonal wetlands in California (Helm 1998).

The Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (Service 2005a) identifies 45 core recovery areas in 13 vernal pool regions for the vernal pool fairy shrimp: Carrizo Region (4 core areas), Central Coast Region (2 core areas), Klamath Mountain Region (3 core areas), Lake-Napa Region (1 core area), Livermore Region (1 core area), Northeast Sacramento (4 core areas), Northwest Sacramento (3 core areas), San Joaquin Region (2 core areas), Santa Barbara Region(2 core areas), Solano-Colusa Region (3 core areas), Southeast Sacramento (4 core areas), Southern Sierra Foothills (6 core areas), and Western Riverside Region (3 core areas). The vernal pool fairy shrimp is presumed to occur in at least one pool in each of these core areas (Service 2005a). The Action Area includes all of these 45 core areas and all occurrences. While there have been continued losses of vernal pool fairy shrimp habitat throughout the various recovery units, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. For the most recent comprehensive assessment of the species' range-wide status, please refer to the Vernal Pool Fairy Shrimp *(Branchinecta lynchi)* 5-Year Review: Summary and Evaluation (Service 2007a). No change in the species' listing status was recommended in this species' 5-year review.

Vernal Pool Tadpole Shrimp

The vernal pool tadpole shrimp occurs or has the potential to occur within the Action Area within its patchy distribution across the California Central Valley, from Shasta County southward to northwestern Tulare County, with isolated occurrences in Alameda and Contra Costa Counties. The CNDDB (2018) lists 324 occurrences for the vernal pool tadpole shrimp. The vernal pool tadpole shrimp occurs only in ephemeral freshwater habitats, including alkaline pools, clay flats, vernal lakes, vernal pools, vernal swales, and other seasonal wetlands in California (Helm 1998).

The Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (Service 2005d) identifies 24 core recovery areas found within seven vernal pool regions for this species: Central Coast Region (1 core area), Northeast Sacramento Region (5 core areas), Northwest Sacramento Region (2 core areas), San Joaquin Region (2 core areas), Solano-Colusa Region (5 core areas), Southeast Sacramento Region (4 core areas) and Southern Sierra Foothills Region (5 core areas). The Action Area includes all of these 24 core areas. While there have been continued losses of vernal pool tadpole shrimp habitat throughout the various recovery units, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. For the most recent comprehensive assessment of the species' range-wide status, please refer to the Vernal Pool Tadpole Shrimp *(Lepidurus packardi)* 5-Year Review: Summary and Evaluation (Service 2007b). No change in the species' listing status was recommended in this species' 5-year review.

Conservancy Fairy Shrimp

The conservancy fairy shrimp occurs or has the potential to occur within the Action Area in Butte, Glenn, Tehama, Merced, Placer, Solano, Stanislaus, Yolo Counties, and one disjunct population on the Central Coast of Ventura County (Service 2012b). The CNDDB (2018) lists 43 occurrences for the conservancy fairy shrimp. The majority of sites inhabited by this species are relatively large and turbid vernal pools called playa pools (Helm 1998, Eriksen and Belk 1999, Vollmar 2002, Service 2005a). Playa pools typically remain inundated much longer than most vernal pools, often well into the summer, even though they normally have maximum depths comparable to vernal pools (Vollmar 2002).

The Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (Service 2005e) identifies eight core recovery areas found within five vernal pool regions for the conservancy fairy shrimp: Vina Plains (Northeast Sacramento Region), Caswell and Grasslands Ecological Area (San Joaquin Region), Ventura County (Santa Barbara Region), Jepson Prairie, Sacramento National Wildlife Refuge and Collinsville (Solano-Colusa Region), and Madera (Southern Sierra Foothills Region). The Action Area includes all occurrences and core recovery areas. While there have been continued losses of conservancy fairy shrimp habitat throughout the various recovery units, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. For the most recent comprehensive assessment of the species' range-wide status, please refer to the Conservancy Fairy Shrimp *(Branchinecta conservatio)* 5-year Review: Summary and Evaluation (Service 2012b). No change in the species' listing status was recommended in this species' 5-year review.

Longhorn Fairy Shrimp

The longhorn fairy shrimp occurs or has the potential to occur within the Action Area in Alameda, Contra Costa, Fresno, Merced and San Luis Obispo Counties (Service 2012a). The CNDDB (2018) lists 20 occurrences for this species. The longhorn fairy shrimp is known only from a few localities, and these sites contain very different types of vernal pool habitats. Longhorn fairy shrimp in the Livermore Vernal Pool Region in Contra Costa and Alameda Counties live in small, clear, sandstone outcrop vernal pools that are sometimes no larger than 3.3 feet (1 m) in diameter, have a pH near neutral, and very low alkalinity and conductivity. Water temperatures in these vernal pools have been measured between 50 and 64 degrees Fahrenheit (Helm 1998). In the San Joaquin and Carrizo Vernal Pool Regions, the longhorn fairy shrimp occur in clear to turbid, grassland pools that may be as large as 203.4 feet (61.7 m) in diameter. Water temperatures in these grassland vernal pools are also warmer, between 50 to 82 degrees Fahrenheit (Helm 1998, Eriksen and Belk 1999).

The Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (Service 2005e) identifies five core recovery areas found within three vernal pool regions for the longhorn fairy shrimp: North Carrizo Plain and South Carrizo Plain (Carrizo Region), Altamont Hills (Livermore Region), and Grasslands Ecological Area (San Joaquin Region). The Action Area includes all occurrences and core areas. While there have been continued losses of longhorn fairy shrimp habitat throughout the various recovery units, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. For the most recent comprehensive assessment of the species' range-wide status, please refer to the Longhorn Fairy Shrimp *(Branchinecta longiantenna)* 5-year Review: Summary and Evaluation (Service 2012a). No change in the species' listing status was recommended in this species' 5-year review.

Threats to Vernal Pool Branchiopods

Habitat loss and fragmentation is the greatest threat to the survival and recovery of vernal pool species. Habitat loss and fragmentation generally is a result of urbanization, agricultural conversion, and mining. Habitat loss occurs in the form of habitat alteration and degradation resulting from changes to natural hydrology; invasive species; incompatible grazing regimes, including insufficient grazing for prolonged periods; infrastructure projects such as roads, water storage and conveyance and utilities; recreational activities such as off-highway vehicles and hiking; erosion; and contamination. This habitat loss and fragmentation contributes to the isolation, fragmentation and functionality of vernal pool habitats. Direct loss of habitat generally represents irreversible damage to vernal pools; it disrupts the physical processes conducive to functional vernal pool ecosystems. The more severe the alteration and destruction, the more difficult it is to recover such areas in the future due to disruption of soil formations, hydrology, seed banks, and other components of a functional vernal pool ecosystem.

Critical Habitat

The Service designated critical habitat collectively for four vernal pool branchiopods and 11 vernal pool plants in 34 counties in California and one county in southern Oregon on August 6, 2003 (Service 2003b) and a revised designation of critical habitat of approximately 858,846 acres was published on August 11, 2005 (Service 2005a).

The PBFs of critical habitat for the four vernal pool branchiopods are the habitat components that provide:

> PBF 1: Topographic features characterized by mounds and swales and depressions within a matrix of surrounding uplands that result in complexes of continuously, or intermittently, flowing surface water in the swales connecting the pools, and providing for dispersal and promoting hydroperiods of adequate length in the pools;
>
> PBF 2: Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water for a minimum of:
>
> - 18 days for vernal pool fairy shrimp;
> - 23 days for longhorn fairy shrimp;
> - 19 days for conservancy fairy shrimp;
> - 41 days for vernal pool tadpole shrimp;
>
> in all but the driest years. Thereby providing adequate water for incubation, maturation, and reproduction. As these features are inundated on a seasonal basis, they do not promote the

development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands;

PBF 3: Sources of food, expected to be detritus occurring in the pools, contributed by overland flow from the pools' watershed, or the results of biological processes within the pools themselves, such as single-celled bacteria, algae, and dead organic matter, to provide for feeding; and

PBF 4: Structure within the pools consisting of organic and inorganic materials, such as living and dead plants from plant species adapted to seasonally inundated environments, rocks, and other inorganic debris that may be washed, blown, or otherwise transported into the pools, that provide shelter.

On February 10, 2006, the Service published a final rule providing species-specific unit descriptions and maps identifying the critical habitat for each individual species. The rule identified the following units and acres within the Action Area for these four vernal pool branchiopods species.

- 597,821 acres within 32 critical habitat units for the vernal pool fairy shrimp in Jackson County, Oregon, and Alameda, Amador, Contra Costa, Fresno, Kings, Mariposa, Monterey, Napa, Placer, San Benito, San Joaquin, San Luis Obispo, Santa Barbara, Shasta, Stanislaus, Tehama, Tulare, Ventura, and Yuba counties, California.

- 13,557 acres within three critical habitat units for the longhorn fairy shrimp in Alameda, Contra Costa, Merced, and San Luis Obispo counties, California.

- 161,786 acres within six critical habitat units for the conservancy fairy shrimp in Butte, Colusa, Mariposa, Merced, Solano, Stanislaus, Tehama, and Ventura Counties, California.

- 228,785 acres within 16 critical habitat units for the vernal pool tadpole shrimp in Alameda, Amador, Butte, Colusa, Fresno, Kings, Madera, Mariposa, Merced, Sacramento, Shasta, Solano, Stanislaus, Tehama, Tulare, Yolo, and Yuba Counties, California.

Based on the documented presence of these four vernal pool branchiopod species in the Action Area, and the biology and ecology of these species, the Service has determined that vernal pool fairy shrimp, vernal pool tadpole shrimp, conservancy fairy shrimp and longhorn fairy shrimp occur within the Action Area.

Sacramento Orcutt Grass

The Sacramento Orcutt grass occurs or has the potential to occur within the Action Area in Sacramento County. The CNDDB (2018) lists 12 occurrences for the species. Sacramento Orcutt grass is an annual grass that occurs in vernal pools on high terrace sites in a narrow zone of remnant depositional stream terraces at the base of the Sierra Nevada foothills (Stone *et al.* 1988).

The Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (Service 2005e), which includes the Sacramento Orcutt grass, identifies three core areas for the species' recovery: Cosumnes/Rancho Seco, Mather and Phoenix Field and Park, all within the Southeast Sacramento vernal pool region. The Action Area includes all occurrences and core areas. While there have been continued losses of Sacramento Orcutt grass habitat throughout the various recovery units, to date no project has proposed a level of effects for which the Service has issued a biological opinion of

jeopardy for the species. For the most recent comprehensive assessment of the species' range-wide status, please refer to the Sacramento Orcutt Grass *(Orcuttia viscida)* 5-Year Review: Summary and Evaluation (Service 2008c). No change in the species' listing status was recommended in this species' 5-year review.

Critical Habitat

The Service designated critical habitat collectively for four vernal pool branchiopods and 11 vernal pool plants in 34 counties in California and one county in southern Oregon on August 6, 2003 (Service 2003b) and a revised designation of critical habitat of approximately 858,846 acres was published on August 11, 2005 (Service 2005a).

The PBFs of critical habitat for the Sacramento Orcutt grass are habitat components that provide:

> PBF 1: Topographic features characterized by isolated mound and intermound complex within a matrix of surrounding uplands that result in continuously, or intermittently, flowing surface water in the depressional features including swales connecting the pools and providing for dispersal and promoting hydroperiods of adequate length in the pools;
>
> PBF 2: Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water or whose soils are saturated for a period long enough to promote germination, flowering, and seed production of predominantly annual native wetland species typically exclude both native and nonnative upland plant species in all but the driest years. As these features are inundated on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands.

On February 10, 2006, the Service (2006a) published a final rule providing species-specific unit descriptions and maps identifying the critical habitat for each individual species. The rule designated 33,273 acres for the Sacramento Orcutt grass within three critical habitat units in Amador and Sacramento Counties.

Threats

Habitat loss and fragmentation is the largest threat to the survival and recovery of the vernal pool species. Habitat loss and fragmentation generally is a result of urbanization, agricultural conversion, and mining. Habitat loss also occurs in the form of habitat alteration and degradation resulting from changes to natural hydrology; invasive species; incompatible grazing regimes, including insufficient grazing for prolonged periods; infrastructure projects such as roads, water storage and conveyance and utilities; recreational activities such as off-highway vehicles and hiking; erosion; and contamination. This habitat loss and fragmentation contributes to the isolation, fragmentation and functionality of vernal pool habitats. Direct loss of habitat generally represents irreversible damage to vernal pools; it disrupts the physical processes conducive to functional vernal pool ecosystems. The more severe the alteration and destruction, the more difficult it is to recover such areas in the future due to disruption of soil formations, hydrology, seed banks, and other components of a functional vernal pool ecosystem. An additional threat to vernal pool plants is the decline of essential pollinators due to habitat fragmentation and the loss of the upland habitat that supports pollinator species. Habitat loss and degradation interferes with reproduction and dispersal of pollinators. It is likely that many of these pollinators require the uplands surrounding vernal pools for completion of their life cycle. For insect pollinated plants, the reduction of available habitat for

pollinators could decrease pollinator populations, which could reduce reproductive success of the plants.

Based on occurrence records, the presence of suitable habitat, and the biology and ecology of the species, the Service has determined that Sacramento Orcutt grass occurs within the Action Area.

Effects of the Proposed Action

The federally-listed species addressed in this programmatic consultation may be directly or indirectly harmed (e.g., killed or injured) as a result of implementing FEMA-funded projects. The effects to listed species addressed in this programmatic biological opinion are project-specific and widely variable. The likelihood that a proposed project will adversely affect covered species or their critical habitats depends on a variety of factors, including, but not limited to, the conditions present in the individual project action area, the probability of species occurrence, timing of the activity, and the quality and quantity of the habitat within the project footprint and its vicinity. For proposed projects covered under the programmatic biological opinion, we anticipate that implementation of general avoidance and minimization measures and species-specific conservation measures, as proposed, will reduce adverse effects, in some instances to levels that are insignificant, discountable, or wholly beneficial.

Activities that are likely to cause direct or indirect harm to covered species and their habitats include grading and earthmoving; road construction; excavation; maneuvering vehicles and heavy equipment on and off roads; discharge of contaminants into soil and water; production of noise, vibration, and dust; vegetation management; prescribed or accidental fire; placement and removal of cofferdams and other temporary water diversions in creeks and rivers; discharge of fill and sediments in water; and placement of riprap and water control structures. Some animal species may occur in close proximity to disaster-affected areas to be indirectly affected by project activities that extend beyond the damaged features themselves, which may include access routes, staging areas, borrow sites, and downstream effects in watercourses. Indirect effects from the covered activities can affect a species ability to breed, feed, disperse, and find shelter. Such indirect effects include the removal of cover and/or habitat, which in turn make the species more vulnerable to predation as they need to travel further to find suitable areas to breed, feed and/or find shelter. Disturbing or displacing species or host plants can reduce the likelihood of breeding, feeding, or finding shelter. Invasive non-native species may be introduced which can result in increased interspecific competition and displacement, and introductions of pathogens can lead to decreased fitness of species and make them more vulnerable to diseases.

Projects funded by FEMA under the Disaster, Mitigation, and Preparedness Programs are limited to repair and replacement of existing facilities and natural areas, rather than newer or expanded construction. Also, many of the projects are in previously disturbed areas. Many of the effects of the proposed projects funded by FEMA will be temporary and localized; conditions are expected to return to baseline levels or become better over time periods ranging from minutes (noise) to a few years (recovery of vegetation). Other actions, while seemingly minor when implemented by themselves, may have cumulative, long-term effects over time. For example, the repair of multiple erosion sites along an earthen canal or creek with riprap will have long-term, cumulative effects both upstream and downstream of each individual project site by hardening the embankment, thereby having an effect on the system's water velocity, transport volume, and other parameters, which may include water quality.

Effects to all covered Species

The following effects are applicable to both aquatic and terrestrial covered species.

Loss and Disturbance of Habitat

All of the covered species may be directly or indirectly affected by temporary disturbance to, or permanent loss of, suitable habitats as a result of proposed projects. Examples of activities that may temporarily or permanently disturb or remove aquatic or terrestrial habitats can be found in the Description of the Proposed Programmatic Actions section of this programmatic biological opinion.

Temporary and permanent habitat disturbances can adversely affect covered species by reducing the availability of key habitat components, which species need for breeding, feeding, sheltering, and dispersing. Habitat loss and disturbance may reduce prey availability and foraging habitat, remove or damage host-plant species, reduce or remove shade cover, or cause incremental degradation or temperature increases to in-water habitats. Additionally, loss of habitat can cause an increase in both interspecific and intraspecific competition leading to displacement, which ultimately decrease an individual's fitness through reduced survival and reproductive success due to physical and physiological constraints. Construction-related habitat disturbances may cause mortality or non-lethal harm such as injury to surviving individuals by being crushed by equipment, maintenance materials, or worker foot traffic.

Although permanent loss or alteration of habitat may occur as part of a Subapplicant's proposed project, this will occur infrequently, and most project footprints are small (many less than one acre), which will affect only small areas. For projects such as fuel reduction, erosion, and sedimentation control, these adverse effects may occur in the short term, but may ultimately result in beneficial effects to plants, wildlife, and covered species.

Implementation of the proposed conservation measures will avoid or reduce the extent and severity of adverse effects. For example, requirements to conduct work outside of the sensitive periods, for breeding, nesting, migration and dispersal periods for covered species, will reduce the effects of such activities which include human disturbance and vibration and noise of construction equipment. Restoring areas to pre-project conditions will enable species to move back into areas after project completion. Providing environmental awareness training to workers and having biological monitors onsite during all construction activities will reduce or eliminate encounters with individual species. Also, clearly delineating work areas and avoidance areas using appropriate construction fencing, seasonal limitations for breeding areas, and appropriate buffers around, for instance, vernal pools. For listed butterflies, appropriate buffers around host plants and hilltop breeding areas as well as seasonal limitations for breeding areas will also reduce or eliminate direct effects. This is also the case with species that use small mammal burrows as refugia, such as California tiger salamanders and California red-legged frogs. The *Conservation Measures* section of this opinion provides a full description of these general and species-specific measures.

Riparian Habitat Removal or Degradation

Listed species inhabiting riparian and aquatic habitats, including California red-legged frog, giant garter snake, California freshwater shrimp, valley elderberry longhorn beetle, and least Bell's vireo, may be directly or indirectly affected by riparian habitat removal and/or degradation by activities such as the following.

- Vegetation management
- Debris removal
- Repairing, realigning, or otherwise modifying roads, trails, utilities, and rail lines
- Repairing, replacing or installing culverts
- Repairing, stabilizing, or armoring embankments
- Creating, widening, clearing, or dredging a waterway
- Constructing or modifying a water crossing
- Constructing or modifying other flood control structures

Habitat fragmentation occurs when areas of connected habitat are disjoined by the removal or reduction of habitat. Therefore, the removal or reduction of riparian habitat has the consequence of fragmenting riparian habitats which have the added consequences of isolation and edge effects. Isolation effects can negatively impact a species ability to find suitable mates thereby reducing its reproductive success. If populations are isolated for long periods of time, this can lead to inbreeding depressions which can make the population more vulnerable to stochastic events. Edge effects generally have a negative impact on both the biotic and abiotic environments. Edge effect negatively impact species through increased risk through the introduction of invasive competitors or pathogens and an increased risk of predation. Effects to the abiotic environment can also negatively impact species by increasing water and ambient temperatures leading to physiological changes that could make the habitat unsuitable for species at all life stages.

California red-legged frog and California tiger salamander riparian habitat can become isolated and fragmented due to the proposed covered activities. The fragmentation and isolation of a subpopulation can lead to a decline in dispersal between subpopulations, jeopardizing the metapopulation. The isolated populations are then vulnerable to local extinction due to stochastic environmental and human-induced events. In addition to fragmentation, the removal of riparian cover can also have negative effects on reproductive success of both the California red-legged frog and the California tiger salamander by allowing more solar radiation to heat pools and slow moving streams. Since the California red-legged frog and the California tiger salamander egg masses can tolerate a maximum water temperature of 70 °F and 66 °F, respectively, incremental increases to water temperatures will reduce reproductive success of both species.

The valley elderberry longhorn beetle occurs throughout the Central Valley in metapopulations and is dependent on a contiguous riparian habitat making is susceptible to habitat fragmentation. The valley elderberry longhorn beetle has a limited dispersal ability adding to their vulnerability of fragmented habitats limiting their opportunity to successfully colonize unoccupied habitat. As a consequence, isolated subpopulations are more vulnerable to stochastic events that can reduce or eliminate isolated populations. Loss of elderberry shrubs associated with riparian habitat will reduce available habitat for the valley elderberry longhorn beetle and may result in take if occupied shrubs are damaged or removed (Service 2017c).

The long-term or permanent removal of riparian vegetation may reduce in-stream habitat quality, riparian habitat complexity, and erosion and sedimentation in cleared riparian areas. Adverse effects may occur to California freshwater shrimp, which depend on complex riparian habitat that includes fine root systems, root wads and overhanging vegetation and woody debris. Loss of riparian vegetation adversely affects the ability of shrimp to disperse and affects turbidity and water temperatures in the creeks and streams.

For the least Bell's vireo, the permanent removal of riparian vegetation could result in reduced quality, quantity, and complexity of habitat within and adjacent to project areas, which can reduce

the suitability of least Bell's vireo nesting areas. Across the landscape, tree and understory removal within suitable foraging, dispersal, roosting, or nesting habitat could indirectly affect least Bell's vireo if tree species composition, structural diversity, or habitat density is significantly or permanently altered. Actions that remove or degrade the quality of riparian habitats may adversely affect their reproductive success by increasing their vulnerability of predation to cowbird parasitism and predation by scrub-jays, hawks, raccoons, and coyotes.

Implementing the conservation measure requiring revegetation of stream and riverbanks with native species when proposed projects remove riparian vegetation during construction activities will minimize these effects to covered species. Removed vegetation will be replaced with in-kind species at a 3:1 ratio with an 80 percent planting survival five years after planting. Conservation measures to clearly delineate and minimize the project footprint will minimize adverse effects to riparian habitats and associated covered species. Requiring Service-approved biological monitors will minimize direct injury and harm to listed species by identifying their presence and allowing them to move out of harm's way. The Conservation Measures section of this programmatic biological opinion provides a full description of these general and species-specific measures.

Hazardous Materials Spills

Spills of hazardous materials may directly or indirectly affect all of the covered species. Chemical contamination of soil or water sources could occur from equipment leaks (e.g., diesel fuel, oil, hydraulic fluids, and antifreeze), refueling spills, or an accidental spill during project implementation. Accidental spills of hazardous materials can degrade water quality or upland habitat to a degree where species are adversely affected or killed by chemicals interfering with physiological pathways. For example, some hazardous chemicals have been shown to mimic estrogen in vertebrates, which has been hypothesized as a leading mechanism in amphibian decline (Jennings 1996).

The implementation of proposed conservation measures will significantly reduce these hazards. Subapplicants will prepare a Spill Prevention and Pollution Control Plan to minimize the risk of spilled hazardous materials and other construction debris from entering soils and waterways. Equipment will be inspected daily for fuel leaks, any fuel leaks discovered will be cleaned up immediately, wet cement and uncured concrete will not be allowed to enter waterways, stockpiled soils will be covered to prevent erosion, and all staging and hazardous material storage areas will be placed in upland areas that are paved, graveled, or otherwise non-erodible and away from water bodies or sensitive habitat. For proposed projects involving work over water, measures will be taken to ensure that construction debris is contained and does not fall into the water. Implementing these measures will minimize the effects of project-related disturbance on covered species and their habitat. The Conservation Measures section of this programmatic biological opinion provides a full description of these general and species-specific measures.

Invasive Species and Pathogens

The introduction of pathogens, invasive plant and animal species could adversely affect any of the covered species. California red-legged frogs and California tiger salamanders are particularly vulnerable to introduced pathogens. Invasive species and pathogens are often introduced to uninvaded sites through construction soil and debris transported on construction equipment. Invasive species and pathogens also may be transferred via construction materials or on the clothing or boots of those working at the site. During in-water work, invasive species and pathogens may be introduced to a water body through ballast or bilge water discharge if vessels are inadequately cleaned prior to transfer between invaded and uninvaded sites. Pathogens may be introduced

through nursery plants used in revegetation and restoration.

Although not all non-native species have negative effects on the covered species, those that outcompete covered species are considered undesirable for their continued persistence. Therefore, introductions of invasive species can increase interspecific completion between listed species and non-native, invasive species. Invasive mosquitofish that are commonly stocked to help combat mosquito larvae have been shown to prefer fairy shrimp species over mosquito larvae (Leyse et al., 2004). Therefore, the introduction of mosquitofish into vernal pool complexes could lead to increased predation of vernal pool fairy shrimp, conservancy fairy shrimp, and longhorn fairy shrimp.

Invasive species can directly injure or kill covered species, or indirectly harm covered species by reducing prey abundance or detrimentally affect aquatic and riparian vegetation. Invasive plants species may also out-compete and crowd out covered plant species, as well as the host plants for listed butterflies.

Chytrid fungi are diverse, abundant, and widespread in aquatic ecosystems. They are known to infect a diverse assemblage of hosts across the tree of life. Although evidence is lacking for their effects on California red-legged frogs and California tiger salamander, some observations have indicated that both species tend to shed their skin at a much higher rate when infected in laboratory settings, which requires the use of additional energy (Service 2016 & 2017b). This allocation of resources to fend off chytrid infection could lead to decreased fitness if infected in the wild. The accidental introduction of chytrid fungi into an area could have significant adverse effects to the California red-legged frog and California tiger salamander. The introduction of non-native species into an ecosystem has the added possibility of introducing novel pathogens that could negatively affect species.

Implementing the proposed conservation measures will significantly reduce the introduction or spread of invasive species and pathogens. Subapplicants will properly clean construction equipment, clothing, waders and boots prior to moving between work sites, particularly if the prior work site is known or suspected to contain invasive species or pathogens. Subapplicants will take all precautions to prevent the introduction of amphibian disease pathogens if California red-legged frogs or California tiger salamanders must be handled or relocated. All persons entering the action area to handle amphibians after working in other aquatic habitats will disinfect all equipment and clothing. The Subapplicants will follow the guidelines in the California Department of Fish and Wildlife's (CDFW's) California Aquatic Invasive Species Management Plan to prevent the spread of invasive aquatic plant and animal species (CDFW 2008). The Conservation Measures section of this programmatic biological opinion provides a full description of these general and species-specific measures.

Beneficial Effects

Beneficial effects include relocating facilities away from sensitive habitats, restoring native vegetation, removing invasive species, improving water quality and hydrology, and vegetation management. Stabilizing eroding banks, reducing sedimentation and turbidity, and replacing or removing structures that form partial or complete barriers with structures that enhance movement corridors or habitat connectivity also provide long-term beneficial effects for covered species. Existing structures may be modified or replaced in ways that provide shade and cover, reduce refugia for predators, replace hardened shorelines with living shoreline structures, improve hydrologic function of stream channels, or increase porosity of previously impervious surfaces. For

example, replacing an undersized, hanging culvert with an open bottom culvert may improve wildlife passage and allow better movement of substrate through the culvert. Wildfire risk-reduction activities may provide a beneficial effect to covered species by reducing the risk of large-scale catastrophic wildfires. Although the above mentioned scenarios can provide beneficial effects to covered species, it is important to note that these benefits can take months or years to be fully realized.

Effects to Aquatic Species

The following effects are primarily applicable to covered aquatic species, which include California red-legged frog, California tiger salamander, giant garter snake, California freshwater shrimp, tidewater goby and vernal pool species.

Erosion, Turbidity and Sedimentation

Increased erosion, turbidity, and sedimentation may affect aquatic species, particularly California red-legged frog and California tiger salamander eggs and larvae, California freshwater shrimp and vernal pool species. Effects include reduced visibility of prey or forage items, respiratory stress, temperature changes, and in severe cases, suffocation and damage to gills, lungs, or other organs. Heavy equipment use during in-water work activities such as installing temporary diversions or dewatering, may cause increased sedimentation. Construction-generated dust may be deposited into nearby waters and vegetation, and terrestrial or riparian vegetation removal and fuel reduction activities may increase erosion and sedimentation during storm runoff events. These activities can lead to the smothering of eggs thereby interfering with the species ability to complete its life cycle.

California freshwater shrimp may be adversely affected by in-stream work that causes high levels of siltation downstream. Although shrimp are usually able to survive in poor water quality conditions, excessive siltation could alter the quality of the habitat to the extent that use by individuals of the species is precluded. Siltation also could fill pools used by shrimp during summer low flows, reducing the extent or quality of shrimp habitat near the project area. Likewise, California red-legged frog and California tiger salamander eggs may be smothered by excessive silt and larvae may have difficulty locating food in turbid waters.

For most covered projects, implementing the proposed conservation measures and best management practices will likely reduce adverse effects to covered species, their prey, and their habitats within vernal pools and other aquatic habitat. These measures include restricting work during seasonal work windows, restricting the entry of heavy equipment into waterbodies, and establishing upland staging areas for equipment and materials. Installing silt fences, sediment curtains, and hay bales will reduce effects from erosion, turbidity, and sedimentation; the dewatering of work areas will minimize the amount and duration of suspended sediment. The Conservation Measures section of this programmatic biological opinion provides a full description of these general and species-specific measures.

Underwater Noise, Vibration and Sound Pressure

Pile driving, in-water drilling, cutting, or excavation can have short-term adverse effects on covered aquatic species such as the tidewater goby, California red-legged frog, and giant garter snake, by increasing in-water noise and vibration. For example, pile driving in or adjacent to water causes high-intensity sound, which acts as a pressure wave that can cause barotrauma to tidewater gobies. California red-legged frogs, California tiger salamanders and giant garter snakes may be more

susceptible to injury and mortality from predation, desiccation and vehicular or foot traffic when project related noise and disturbance causes them to move away from sheltered habitat areas within a construction area.

Implementing the proposed conservation measures will minimize the effects of noise, vibration, and sound pressure. These include the use of work windows to avoid times that species such as the giant garter snake and California red-legged frog are most active, and using biological monitors to determine if animals are in the work area prior to ground disturbing activities. The Conservation Measures section of this programmatic biological opinion provides a full description of these general and species-specific measures.

Streambed, Bank and Shoreline Modification

Any replacement of natural or armored banks that provide refugia for California red-legged frogs or giant garter snakes with banks that provide no such refugia (e.g., concrete crib walls or sacked concrete) will result in permanent habitat and permanent adverse effects to the hydrology and habitat quality of the stream or estuary. These activities will result in the removal of emergent and riparian vegetation along banks or in the channel or wetland, resulting, for example, in the loss of cover needed for giant garter snake basking, foraging, or shelter. Removal of burrows along streambanks that giant garter snakes and California red-legged frogs could use as refugia may result in increased mortality due to predation. Work in streams that causes unusually high levels of siltation downstream can also adversely affect California freshwater shrimp.

Implementing the proposed conservation measures will minimize adverse effects to species and habitats caused by these project activities. These measures include avoiding placement of roads, staging areas, and other facilities adjacent to aquatic ecosystems as much as possible, and returning contours of the aquatic substrate environments, vegetation, and flows to pre-construction conditions or better after the completion of work. Implementing best management practices for erosion control and reducing the area to be disturbed to the minimum necessary should decrease the amount of sediment that is washed downstream as a result of project activities. Designing projects to minimize the creation of new impervious surfaces and using bioengineering and living shorelines techniques may also avoid or minimize adverse effects, where applicable. The Conservation Measures section of this programmatic biological opinion provides a full description of these general and species-specific measures.

Permanent Loss or Alteration of Vernal Pool Habitat

Vernal pool habitats support several covered species including four vernal pool branchiopods, California tiger salamanders and Sacramento Orcutt grass. Vernal pool habitats occupy areas with specific soil, geology and microtopography, making them highly susceptible to degradation from ground-disturbing activities. Many vernal pool areas contain hardpan soils that, if disturbed, will no longer hold water appropriately. Vernal pools also rely on runoff from surrounding areas during winter rains to refill. Regrading these areas may affect the flow of water and alter the amount of water entering the vernal pool. These activities, as well as effects from erosion, dust, and construction activities may temporarily or permanently alter vernal pool habitat, making such areas less suitable for the covered species occupying the habitat.

Vernal pool species are especially vulnerable to alterations in the existing hydrology of vernal pool habitats, because the timing, water depth, and inundation period determines which vernal-pool plants and branchiopods are able to reproduce and persist in a given vernal pool. For example,

indirect alterations to the hydrology of vernal pool habitats can result in too little soil moisture for the germination of plant seeds or hatching of vernal pool branchiopod eggs. Indirect alterations to the hydrology of vernal pool habitats may also cause vernal pools to dry too fast, or cause vernal pool water temperatures to increase too soon for a vernal pool species to complete its lifecycle and reproduce.

This programmatic biological opinion does not cover proposed projects that involve placement of fill material in, or excavation of, any vernal pools (wet or dry) as this will require a separate section 7 consultation. However, grading, excavation and filling outside of a vernal pools may have indirect effects on vernal swales and vernal complexes by altering the natural hydrology either upstream or downstream. This can cause unseasonal drying or flooding that can negatively affect species that occupy vernal pool habitats, which can lead to species unable to complete their life cycle. Upland habitat and swales around a vernal pool and within a vernal pool complex are essential to the hydrological and biological integrity of the vernal pool and complex. Typically, if any portion of a vernal pool is affected, then the entire vernal pool is considered affected. Where the reach of these indirect effects cannot be determined definitively, the Service considers most activities in areas within 250 feet of a vernal pool to be indirectly affected.

In addition to the proposed general conservation measures, implementing the proposed species-specific conservation measures will minimize adverse effects. These proposed conservation measures include pre-construction surveys, construction monitoring by a Service-approved biologist, establishing construction work windows and activity buffers, and identifying and flagging sensitive areas. Mortality-related effects will be minimized by requiring work within 250 feet of vernal pool habitat be avoided to the maximum extent possible and, if it does occur, to happen only in the dry season and to have no permanent adverse effects to hydrology of the pools or the pool complex. The Conservation Measures section of this programmatic biological opinion provides a full description of these general and species-specific measures.

Effects from Dewatering, and Capture and Relocation of Aquatic Species

Proposed projects may involve dewatering and capture and relocation in waters occupied by covered species. Projects involving in-water work may require dewatering to properly install structures. In general, gravity conveyance via cofferdams and pipe systems is preferred when diversion of live-stream flows is necessary. However, in some cases pumps may be needed. If a pump is used, Subapplicants will screen the pump using an appropriate screen size for the target species to prevent entrainment, refer to species-specific conservation measures for appropriate screen sizes.

Dewatering, capture, and relocation of a covered species may reduce the magnitude of take and other effects when conducting in-water work. In such cases, implementing the proposed conservation measures will minimize the short-term adverse effects of such actions. Screening pump intakes as proposed in the species-specific conservation measures will reduce the probability that California red-legged frog tadpoles get caught in the inflow. Intakes will be completely screened with wire mesh no larger than indicated in the species-specific conservation measures and the intake will be placed within a perforated bucket or other method to attenuate suction to prevent species from entering the pump system. Temporary dewatering structures will be left in place for the minimum amount of time necessary for construction to allow covered aquatic species to return to the habitat.

Capture and relocation may cause mortality of a small number of individuals. Although the mortality rate associated with capture and relocation is typically low, relocated individuals are subject to stress and injury or death from the handling associated with relocation.

Temporary dewatering of creeks, ponds, or wetlands may harm or kill giant garter snake adults or young if they are not able to move on their own into nearby suitable habitat. Giant garter snakes that leave a construction area may move away from shelter and be more susceptible to injury and mortality from predation and vehicular or foot traffic. Displaced snakes may experience increased competition from animals in adjacent areas. Temporary dewatering of creeks, ponds, or wetlands may harm or kill California red-legged frog adults, larvae and eggs if they are not translocated to suitable habitat. Tadpoles may be injured or killed if entrained by pump or water diversion intakes. Chytrid fungi may be spread to California red-legged frogs and California tiger salamanders during capture and relocation if done without proper handling techniques and practices. Dewatering may strand, kill or injure California freshwater shrimp. They are small, inconspicuous and can take cover in areas that are difficult for a biologist to fully inspect. Shrimp may also be entrained by water pump systems and be injured or die. Injury and mortality may also occur to California freshwater shrimp during capture and relocation due to their fragile and delicate nature.

The short-term adverse effects of relocation will be minimized by implementing the proposed conservation measures. Only Service-approved biologists, using the most recent Service guidelines for relocation methods, will conduct capture and relocation. The Service-approved biologist will take precautions to prevent the introduction of amphibian diseases such as chytrid fungus in accordance with the Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander (Service 2003c). Disinfecting equipment and clothing is especially important when biologists are coming to the Action Area to handle amphibians after working in other aquatic habitats. California red-legged frogs and the California tiger salamanders will also be handled and assessed according to the Restraint and Handling of Live Amphibians (USGS National Wildlife Health Center 2001). The Conservation Measures section of this programmatic biological opinion provides a full description of these general and species-specific measures.

Effects to Terrestrial Species

The following effects are primarily applicable to covered terrestrial species, which includes California red-legged frog, California tiger salamander, giant garter snake, Alameda whipsnake, Bay checkerspot butterfly, callippe silverspot butterfly, Myrtle's silverspot butterfly, and least Bell's vireo. These effects are also applicable to terrestrial habitats utilized by covered amphibians.

Habitat Disturbances, Noise, and Vibration

Noise and vibration associated with construction work may adversely affect many of the covered species. The movement and operation of heavy equipment during Subapplicants' proposed project activities, such as vibratory pile driving, impact pile driving, drilling, cutting, or excavation can have indirect effects on covered species by increasing ambient noise and vibration. Noise and vibration may affect covered species' breeding, foraging, and dispersal behavior. Noise and vibration from project activities may adversely affect covered birds, resulting in nest abandonment, fleeing, and temporary cessation of feeding or courtship behaviors. Additionally, this could impact future population sizes and connectivity of metapopulations. However, in many cases, these effects will be temporary in nature and likely limited to the construction period.

Work activities, including noise and vibration, may cause all terrestrial species to leave the work area. This disturbance may increase the likelihood for covered species vulnerability to predation or desiccation. Alameda whipsnakes and giant garter snakes may be harmed as a result of noise and

vibration associated with construction work; individuals displaced from protective cover are subject to predation and accidental death or injury from vehicular or foot traffic as they move across the landscape to avoid the area. Displaced snakes also may experience increased competition from animals in adjacent areas. Nesting birds, such as the least Bell's vireo may be flushed from nesting areas, abandoning nests and young in response to significant noise disturbance. Eggs and young are more vulnerable to predation when adults are flushed from nests. Construction-related noise can also adversely affect covered butterfly species, by startling them away from a safe area thus making them more vulnerable to collisions with vehicles and equipment and predation by other species.

Projects that require lighting could result in direct and indirect effects on the covered species. Direct effects to covered bird species will be primarily associated with changes in behavior. Lights may cause disruption, such as disorientation, in local, seasonal, or long-distance dispersal or migration events. These effects may be temporary or permanent, and may alter breeding or foraging behaviors, or affect the ability of species to find or return to breeding territories. Lighting structures provide raptor roosting sites which can lead to indirect effects to the giant garter snake by making them more vulnerable to predation when dispersing or basking.

The potential for disturbance and displacement of California red-legged frogs, California tiger salamanders and other covered species will be minimized by implementing Conservation Measures that require onsite biological monitoring, worker education programs, and successful capture and relocation of individuals. The likelihood of disturbance and displacement will be further reduced by avoidance, when feasible, of California red-legged frog and central California tiger salamander aquatic and upland habitat, as proposed. Conservation measures that minimize the area disturbed by project-related activities will reduce the potential for fleeing and abandonment as a result of the action, as will the requirement to work outside of the nesting season.

Barriers to Migration and Movement

Barriers to migration and movement may be temporary (during construction) or permanent and could result in partial or localized blockage of covered species migration or movement. Effects to covered species migration or movement could differ depending on the covered species, timing, and size of the project and the nature of the activity. Such barriers could result from activities such as the conversion of land to unsuitable habitat; the loss of suitable habitat associated with vegetation management; or the repair, replacement, or construction of new highways, walls, or other infrastructure. The California tiger salamander is dependent on barrier-free landscapes for successful migration and dispersal. Therefore, these types of new barriers will reduce connectivity of the metapopulation, isolating subpopulations making them more vulnerable to stochastic events and less likely to be recolonized if extirpated.

Most proposed projects are either associated with existing infrastructure, expected to be small in scale, and/or localized; therefore, these effects are not expected to significantly change the baseline conditions present in the Action Areas. Instead, the effects of barriers to covered species migration and movement may be incrementally altered. In some instances, these alterations may improve the existing conditions and, in others, may decrease the ability for species to freely move between habitats. In general, partial or complete barriers may directly affect a species' breeding, foraging, and dispersal behaviors. Barriers may restrict movement, alter or restrict access to key habitats, or result in entrainment, injury, or mortality. Barriers may adversely affect species' dispersal behaviors, which are important to continue genetic mixing in a population. Loss or impairment of this function may result in population isolation or in population sinks or extirpation.

Implementation of proposed conservation measures will reduce the footprint associated with the work area, access road and staging areas within certain habitats, and areas commonly used as wildlife movement corridors.

Trampling, Crushing or Entrapment

Activities involving vegetation clearing, earth moving, pipeline installation, and other construction may adversely affect covered species through trampling, crushing or entrapment within natural and artificial structures. Natural structures may include mammal burrows, rubble piles, rock outcrops and root wads. Artificial structures include trenches, pipes, and construction equipment.

Direct effects associated with entrapment include injury and mortality. Excavation, movement or depositing of materials above natural structures may entrap covered species resulting in harm, injury, or mortality. Covered species such as California red-legged frogs, California tiger salamanders or Alameda whipsnakes may fall into an excavated trench and subsequently be buried or physically removed. These same covered species may occupy a pipe or construction equipment and be subject to take through direct handling and removal by construction personnel or biologist, movement of construction equipment or materials, and burial of construction material or pipe. Some of the effects associated entrapment may be temporary, such as physical handling and movement or falling into a trench, while other effects such as burial or movement of construction equipment and material may be permanent and lethal.

Direct effects on all covered species as a result of a proposed project includes injury or mortality from being crushed by equipment, maintenance materials, or worker foot traffic. Equipment, vehicles, and personnel working in open, upland grassland habitats may injure, or kill all life stages of covered butterfly species. Chrysalides, larvae, adults, and their larval host plants may be crushed or buried, and adults may be injured or killed by collisions with construction equipment. Species that take refuge in burrows such as California red-legged frog and California tiger salamander, and rocks and crevices such as the Alameda whipsnake, are highly vulnerable to crushing in their refugia or when they leave their refugia in response to disturbance.

These effects will be reduced by the proposed conservation measures, including minimizing and clearly demarcating the boundaries of activity areas, pre-construction surveys, and the presence of a Service-approved biologist during construction activities who will have the authority to halt work activities until the animal leaves the area on its own. Construction-related disturbance to butterfly host plants and breeding adults will be avoided and minimized through pre-construction surveys, biological monitors, and appropriate buffers around host plants and hilltop breeding areas as well as implementing seasonal limitations for work in breeding areas. Adverse effects to Alameda whipsnake will be minimized by avoiding rock outcroppings and scrub habitats, limiting the timing of activities to the summer and early fall to avoid disturbance to breeding and young, and removing vegetation by hand in areas with shrub vegetation.

Inadvertent entrapment will be avoided by covering all excavated, steep-walled trenches and holes greater than 6 inches at the end of each workday, or providing escape ramps. Relocating listed species out of harm's way, as proposed, may further minimize injury or mortality. The potential for uninformed workers to disturb, injure, or kill covered species will be greatly reduced by proposed education of workers as to the presence and protected status of species and the measures that will be implemented to protect it during work activities.

Critical Habitat

As described above, the Action Area encompasses the entire SFWO's jurisdiction and all critical habitat units within the SFWO's jurisdiction for the California red-legged frog, California tiger salamander (Central and Sonoma DPSs), Alameda whipsnake, tidewater goby, valley elderberry longhorn beetle, Bay checkerspot butterfly, vernal pool fairy shrimp, vernal pool tadpole fairy shrimp, conservancy fairy shrimp, longhorn fairy shrimp, and Sacramento Orcutt grass. The Service anticipates that projects funded by FEMA could negatively affect some of the critical habitat units and PBFs for these species within the Action Area.

California Red-Legged Frog
The Service anticipates that the activities associated with the proposed action could negatively affect PBF 1 (aquatic breeding habitat), PBF 2 (non-breeding aquatic habitat), PBF 3 (upland habitat), and PBF 4 (dispersal habitat) of the California red-legged frog critical habitat within the Action Area. However, these activities will likely result in minor effects to habitat as most projects will restore the area to pre-disaster conditions. The Action Area contains aquatic breeding and non-breeding habitat (PBFs 1 and 2) in the form of ponds, creeks, and streams. This habitat could be affected by construction activities through erosion from project activities such as culvert replacement, though following conservation measures will minimize these effects. However, constructing flood control structures such as levees could channelize the applicable waterway permanently affecting the PBFs making them less suitable for the California red-legged frog. Some permanent activities are proposed such as constructing new facilities or relocating existing facilities outside of disaster prone areas. These activities will permanently affect upland and dispersal habitat (PBFs 3 and 4) by installing structures on high quality habitat which will remove upland areas for the California red-legged frog to hide and will create barriers to movement to and from aquatic areas. However, the footprint of the project will confine these effects to a small area. When implemented with both the general and species-specific conservation measures, these proposed activities will not prevent critical habitat from providing essential conservation values for the California red-legged frog.

California Tiger Salamander (Central California and Sonoma DPSs)
The Service anticipates that the activities associated with the proposed action could negatively affect PBF 1 (aquatic breeding habitat), PBF 2 (upland habitat), and PBF 3 (dispersal habitat) of the California tiger salamander critical habitat within the Action Area. However, these activities will likely result in minor effects to habitat as most projects will restore the area to pre-disaster conditions. Activities with a larger effect are those that will construct new facilities such as developing demonstration projects. These projects have to potential to fill aquatic breeding habitat (PBF 1), excavate and fill burrow systems (PBF 2), and construct barriers that prevent movement to and from breeding sites (PBF 3). When implemented with both the general and species-specific conservation measures, these activities will not prevent critical habitat from providing essential conservation values for the California tiger salamander.

Alameda Whipsnake
The Service anticipates that the activities associated with the proposed action could negatively affect PBF 1 (scrub/shrub community), PBF 2 (woodland/grassland community), and PBF 3 (rock outcrops) of the Alameda whipsnake critical habitat within the Action Area. However, these activities will likely result in minor effects to habitat as most projects will restore the area to pre-disaster conditions. Activities such as realigning roads around disaster areas could affect all three PBFs by permanently removing them and creating a paved road. As most of the activities are water related, the number of projects affecting Alameda whipsnake critical habitat will be small. When

implemented with both the general and species-specific conservation measures, these activities will not prevent critical habitat from providing essential conservation values for the Alameda whipsnake.

Tidewater Goby
The Service anticipates that the activities associated with the proposed action could negatively affect PBF 1a (substrate), PBF 1b (aquatic vegetation), PBF 1c (sandbars) of the tidewater goby critical habitat within the Action Area. However, these activities will likely result in minor effects to habitat as most projects will restore the area to pre-disaster conditions. As the specific PBFs are flexible depending on the water level, repairing coastal features such as coastal flood-control structures could affect the PBFs by shrinking the amount of available habitat that fall within the PBFs should the repair extend outside of the original footprint. When implemented with both the general and species-specific conservation measures, these activities will not prevent critical habitat from providing essential conservation values for the tidewater goby.

Valley Elderberry Longhorn Beetle
The designated critical habitat for the valley elderberry longhorn beetle is limited to a small geographical area along the American River in Sacramento County, and the adverse effects from activities on critical habitat will be minimal. Activities associated with the proposed action could negatively affect critical habitat of the valley elderberry longhorn beetle within the Action Area. Given the location and size of the valley elderberry longhorn beetle critical habitat, the Service does not anticipate effects to critical habitat by Subapplicants. However, if activities occur in critical habitat they will only result in minor effects to habitat, and these activities, when implemented with both the general and species-specific conservation measures, will not prevent critical habitat from providing essential conservation values for the valley elderberry longhorn beetle.

Bay Checkerspot Butterfly
The Service anticipates that the activities associated with the proposed action could negatively affect PBF 1 (grass land community), PBF 2 (host plant), PBF 3 (nectar source), PBF 4 (soil type), and PBF 5 (shelter) of the Bay checkerspot butterfly critical habitat within the Action Area. However, these activities will likely only result in minor effects to habitat as most projects will restore the area to pre-disaster conditions. The repair of roads that run through critical habitat after a disaster could pose a risk to all PBFs. Depending on the timing of repairs, PBF 5 could be most affected during the summer months of the Bay checkerspot butterfly summer diapause. However, the projects footprint will confine these effects to a small area. When implemented with both the general and species-specific conservation measures, these activities will not prevent critical habitat from providing essential conservation values for the Bay checkerspot butterfly.

Vernal Pool Branchiopods
The Service anticipates that the activities associated with the proposed action could negatively affect PBF 1 (topographic features), PBF 2 (depressional features), PBF 3 (food sources), and PBF 4 (shelter) of the vernal pool branchiopods critical habitat within the Action Area. However, these activities will likely only result in minor effects to habitat as most projects will restore the area to pre-disaster conditions. Activities associated with the proposed action could negatively impact all four PBFs if activities are located adjacent to vernal pool branchiopod critical habitat. The habitat could be affected by construction activities that divert extra water to or from the vernal pool critical habitat. Altering the topography of adjacent sites could negatively impact PBF 2 by altering the frequency and duration of filling. Additionally, this change could affect prey species (PBF 3) and vernal pool plants that provide shelter (PBF 4). However, project footprints will confine these effects to a small area. When implemented with both the general and species-specific conservation measures, these activities will not prevent critical habitat from providing essential conservation

values for the vernal pool branchiopods.

Sacramento Orcutt Grass

The Service anticipates that the activities associated with the proposed action could negatively affect PBF 1 (topographic features) and PBF 2 (depressional features) of the Sacramento Orcutt grass critical habitat within the Action Area. However, these activities will likely only result in minor effects to habitat as most projects will restore the area to pre-disaster conditions. Similar to affect to vernal pool branchiopod critical habitat. Sacramento Orcutt grass will be affected by project activities adjacent to critical habitat, which will affect both PBF 1 and PBF 2. However, project footprints will confine these effects to a small area. When implemented with both the general and species-specific conservation measures, these activities will not prevent critical habitat from providing essential conservation values for the Sacramento Orcutt grass.

Most of the covered activities will only result in minor effects limited to small areas. These activities are not likely to diminish the quality of PBFs in a unit for any of the covered species critical habitat. While disturbance within critical habitat may prevent some covered species from using portions of the critical habitat for essential life function whether temporarily or permanently, they will still be able to complete their essential ecological and biological functions in the remaining areas of critical habitat. Therefore, all critical habitat units will retain their PBFs and the PBFs within each critical habitat unit for each covered species will still remain functional. Consequently, the designated critical habitat for all covered species will still be able to perform its intended functions and conservation role.

In conclusion, the Service determines that the majority of activities associated with any proposed projects will result in only minor effects to PBFs, and with implementation of the conservation measures, will not prevent critical habitat from providing essential conservation values. The restoration of native vegetation, removing invasive species, improving water quality and hydrology, stabilizing eroding banks, reducing sedimentation, replacing structures that form partial or complete barriers to movement, and vegetation management to reduce wildfire risk will have negligible or beneficial effects to critical habitat. This determination is further based on the fact that projects funded by FEMA primarily will occur in previously disturbed areas, and the project footprint of most individual projects will be small in size and impact. The Service anticipates that habitat loss and degradation at individual project sites will be minimal and implementation of conservation measures will further minimize effects.

Cumulative Effects

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the Action Area considered in this programmatic biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The following actions may affect the species covered in this programmatic biological opinion by directly or indirectly harming individuals or by adversely affecting designated or proposed critical habitats.

An undetermined number of future land use conversions and routine land management practices frequently are not reviewed for environmental compliance under the federal permitting process. These activities may alter the habitat or increase incidental take of federally-listed species and are cumulative to the proposed programmatic actions. However, due to the large area covered under this programmatic biological opinion, the Service is unable to provide specific information to determine cumulative effects.

Conclusion

After reviewing the current status of the 16 animal and one plant species covered by this programmatic biological opinion, the species' status and environmental baseline for the Action Area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that FEMA's Disaster, Mitigation, and Preparedness Program in California, as proposed, is not likely to jeopardize the continued existence of the following species:

California red-legged frog (*Rana draytonii*)
California tiger salamander (*Ambystoma californiense*)
- Central California DPS
- Sonoma DPS

Giant garter snake (*Thamnophis gigas*)
Alameda whipsnake (*Masticophis lateralis euryxanthus)*
Least bell's vireo (*Vireo bellii pusillus*)
Tidewater goby (*Eucyclogobius newberryi*)
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)
California freshwater shrimp (*Syncaris pacifica*)
Bay checkerspot butterfly (*Euphydryas editha bayensis*)
Callippe silverspot butterfly (*Speyeria callippe callippe*)
Myrtle's silverspot butterfly (*Speyeria zerene myrtleae*)
Vernal pool fairy shrimp (*Branchinecta lynchi*)
Vernal pool tadpole shrimp (*Lepidurus packardi*)
Conservancy fairy shrimp (*Branchinecta conservatio*)
Longhorn fairy shrimp (*Branchinecta longiantenna*)
Sacramento Orcutt grass (*Orcuttia viscida*)

The Service reached this conclusion because the project-related effects to the species, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding recovery or reducing the likelihood of survival of the species based on the following: (1) FEMA, in coordination with the Service, has proposed an extensive suite of general and species-specific conservation measures to be implemented for each project that are directed towards the protection of the habitat and, therefore, the long-term protection of individual species; (2) most individual project areas will have small footprints (less than one acre), therefore, not all populations or habitats will be affected by the proposed actions; and (3) FEMA will initiate individual section 7 consultations on all actions involving species and projects that do not specifically qualify for coverage under this programmatic biological opinion, as described in the programmatic biological assessment.

Critical habitat is designated for 13 species covered by this programmatic biological opinion. After reviewing the current status of designated critical habitat for these species, the environmental baseline for the Action Area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that FEMA's Disaster, Mitigation, and Preparedness Program in California, as proposed, is not likely to destroy or adversely modify designated critical habitat for the following species:

California red-legged frog (*Rana draytonii*)
California tiger salamander (*Ambystoma californiense*)
- Central California DPS

- Sonoma DPS

Alameda whipsnake (*Masticophis lateralis euryxanthus*)
Least bell's vireo (*Vireo bellii pusillus*)
Tidewater goby (*Eucyclogobius newberryi*)
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)
Bay checkerspot butterfly (*Euphydryas editha bayensis*)
Vernal pool fairy shrimp (*Branchinecta lynchi*)
Vernal pool tadpole shrimp (*Lepidurus packardi*)
Conservancy fairy shrimp (*Branchinecta conservatio*)
Longhorn fairy shrimp (*Branchinecta longiantenna*)
Sacramento Orcutt grass (*Orcuttia viscida*)

The Service reached this conclusion because the project-related effects to the designated critical habitat for these 13 species, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding the function of the critical habitat to serve its intended conservation role for the species based on the following: (1) FEMA, in coordination with the Service, has proposed an extensive suite of general and species-specific conservation measures that will be implemented for each project; (2) the majority of the effects of the projects are temporary and not persistent; (3) most of the projects restore structures such as roads, bridges, or other pre-existing facilities that are not in themselves physical and biological features essential to species' conservation; and (4) the effects to critical habitat for these 13 species are small and discrete, relative to the entire area designated, and are not expected to appreciably diminish the value of the critical habitat or prevent it from sustaining its role in the conservation of these species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by Service regulations at 50 CFR 17.3 as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the same regulations as an act which actually kills or injures wildlife. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by FEMA so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. FEMA has a continuing duty to regulate the activity covered by this incidental take statement. If FEMA (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, FEMA must report the progress of the action and its impact on the species to the Service as

specified in the incidental take statement [50 CFR §402.14(i)(3)].

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally-listed endangered plants or the malicious damage of such plants on areas under federal jurisdiction, or the destruction of endangered plants on non-federal areas in violation of State law or regulation or in the course of any violation of a State criminal trespass law.

Amount or Extent of Take

The Service is providing mechanisms to quantify when we consider take of the 16 covered animal species to be exceeded as a result of implementing the proposed project. We will use the following detections of injured or dead individuals per project site, total per year and total for the 5-year duration of this programmatic biological opinion. The detection of injured or dead individuals may indicate that species' utilization of habitat within the Action Area has changed over the lifetime of the project. By setting these thresholds, we have set an incidental take limit that is measureable, irrefutable and indicates that the species are being affected at a level where avoidance and minimization measures and project implementation need to be evaluated and possibly modified.

California Red-legged Frog

The Service is authorizing take incidental to the proposed action as the injury or fatality of no more than three juvenile or adult California red-legged frogs per site per year, no more than 30 juveniles or adult California red-legged frogs total for all sites per year, and no more than 150 juvenile or adult California red-legged frogs for the 5-year duration of this programmatic biological opinion.

Accordingly, the Service concludes that the incidental take (injury or fatality) of California red-legged frogs will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. death or injury of more than three juvenile or adult California red-legged frogs per site per year;
2. death or injury of more than 30 juveniles or adults total for all sites per year; or
3. death or injury of more than 150 juveniles or adults, as detected during the 5-year duration of the programmatic biological opinion by the FEMA Subapplicants, biological monitors, or other personnel.

Central California Tiger Salamander

The Service is authorizing take incidental to the proposed action as the injury or fatality of no more than three juvenile or adult central California tiger salamanders per site per year, no more than 30 juvenile or adult central California tiger salamanders total for all sites per year, and no more than 150 juvenile or adult central California tiger salamanders for the 5-year duration of this programmatic biological opinion.

Accordingly, the Service concludes that the incidental take (injury or fatality) of central California tiger salamanders will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. death or injury of more than three juvenile or adult central California tiger salamanders per site per year;
2. death or injury of more than 30 juvenile or adult central California tiger salamanders total for all sites per year; or
3. death or injury of more than 150 juvenile or adult central California tiger salamanders during the 5-year duration of the programmatic biological opinion, as detected by the FEMA Subapplicants, biological monitors, or other personnel.

Sonoma California Tiger Salamander

The Service is authorizing take incidental to the proposed action as the injury or fatality of no more than one juvenile or adult Sonoma California tiger salamander per site per year, no more than 15 juvenile or adult Sonoma California tiger salamanders total for all sites per year, and no more than 75 juvenile or adult Sonoma California tiger salamanders for the 5-year duration of this programmatic biological opinion.

Accordingly, the Service concludes that the incidental take (injury or fatality) of Sonoma California tiger salamanders will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. death or injury of more than one juvenile or adult Sonoma California tiger salamander per site per year;
2. death or injury of more than 15 juveniles or adult Sonoma California tiger salamanders total for all sites per year; or
3. death or injury of more than 75 juvenile or adult Sonoma California tiger salamanders during the 5-year duration of the programmatic biological opinion, as detected by the FEMA Subapplicants, biological monitors, or other personnel.

Giant Garter Snake

The Service is authorizing take incidental to the proposed action as the injury or fatality of no more than three juvenile or adult giant garter snakes per site per year, no more than 30 juvenile or adult giant garter snakes total for all sites per year, and no more than 150 juvenile or adult giant garter snakes for the 5-year duration of this programmatic biological opinion.

Accordingly, the Service concludes that the incidental take (injury or fatality) of giant garter snakes will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. death or injury of more than three juvenile or adult giant garter snake per site per year;
2. death or injury of more than 15 juvenile or adult giant garter snakes total for all sites per year; or
3. death or injury of more than 75 juvenile or adult giant garter snakes during the 5-year duration of the programmatic biological opinion, as detected by the FEMA Subapplicants, biological monitors, or other personnel.

Least Bell's Vireo

The Service anticipates that incidental take of the least Bell's vireo associated with FEMA's proposed action will be difficult to detect or quantify because the species will be difficult, if not impossible, to detect at any given project site. Providing a meaningful number for incidental take is difficult because a surveyor can only count what they see. Least Bell's vireo are small, secretive, and occur in habitats that make detection difficult, thereby making them nearly impossible to locate during pre-activity survey efforts. Under such conditions, finding a dead or injured individual vireo is unlikely within a project activity area, or mortality may be masked by seasonal fluctuations in numbers and migration. In addition, in most cases there have been no prior formal surveys in areas where projects are likely to occur. There is a risk of harm, injury and mortality as a result of the proposed activities and the permanent and temporary loss or degradation of suitable habitat; however, proper implementation of general and species-specific conservation measures should be effective in preventing incidental take due to harm, injury, or mortality. If a single individual is killed or injured, there is no means of equating one dead or injured animal (assuming one was found) to a number of dead or injured animals not observed.

Since we cannot estimate the number of individual least Bell's vireo that will be incidentally taken for the reasons listed above, the Service is providing a mechanism (acres) to quantify when we will consider take to be exceeded as a result of the proposed project. Since we expect take to result from the proposed project's effects to habitat, the quantification of habitat becomes a direct surrogate for the species that will be taken. Therefore, the Service anticipates that all least Bell's vireo inhabiting individual project footprints within the Action Area will be subject to incidental take in the form of non-lethal harm in terms of habitat only. No other forms of take are authorized. The Service anticipates and is authorizing the take of not more than one acre of actual habitat at any given project site that is less than 20 acres or no more than five percent of habitat at a particular site that is 20 acres or greater. This five percent at a particular site cannot represent more than five percent of the entire range of a covered species, for the five-year term of the programmatic biological opinion.

Accordingly, the Service concludes that the incidental take of least Bell's vireo will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. more than 1 acre of actual habitat at any given project site that is less than 20 acres is taken;
2. more than 5 percent of habitat at a particular site that is 20 acres or greater is taken; or
3. if this 5 percent at a particular site represents more than 5 percent of the entire range of a covered species is taken, for the 5-year term of the programmatic biological opinion.

Valley Elderberry Longhorn Beetle

The Service anticipates incidental take of the valley elderberry longhorn beetle will be difficult to detect or quantify. The cryptic nature of this species and their relatively small body size make finding a dead specimen unlikely. The species' occurrences within its habitat make them difficult to detect. Due to the difficulty in quantifying the number of dead or injured individual beetles that will be taken as a result of the proposed action, the Service is quantifying take incidental to the proposed action as the number of elderberry shrubs with stems one inch or greater in diameter at ground level (VELB habitat) that may become unsuitable for valley elderberry long horn beetles due to direct and indirect effects as a result of the proposed project. Therefore, the Service anticipates that all valley elderberry longhorn beetles inhabiting elderberry shrubs containing stems 1-inch or greater in diameter at ground level within

individual project action areas will be harmed or killed as a result of the proposed action. The Service is not further quantifying take (injury or fatality) of actual individual beetles or their larvae incidental to the proposed action.

Since we cannot estimate the number of individual valley elderberry longhorn beetles that will be incidentally taken for the reasons listed above, the Service is providing a mechanism (acres) to quantify when we will consider take to be exceeded as a result of the proposed project. Since we expect take to result from the proposed project's effects to habitat, the quantification of habitat becomes a direct surrogate for the species that will be taken. Therefore, the Service anticipates that all valley elderberry longhorn beetles inhabiting individual project footprints within the Action Area will be subject to incidental take in the form of non-lethal harm and harassment. The Service anticipates and is authorizing the take of not more than one acre of actual habitat at any given project site that is less than 20 acres or no more than five percent of habitat at a particular site that is 20 acres or greater. This five percent at a particular site cannot represent more than five percent of the entire range of a covered species, for the five-year term of the programmatic biological opinion.

Accordingly, the Service concludes that the incidental take of valley elderberry longhorn beetle will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. more than 1 acre of actual habitat at any given project site that is less than 20 acres is taken;
2. more than 5 percent of habitat at a particular site that is 20 acres or greater is taken; or
3. if this 5 percent at a particular site represents more than 5 percent of the entire range of a covered species is taken, for the 5-year term of the programmatic biological opinion.

California Freshwater Shrimp

The Service is authorizing take incidental to the proposed action as the injury or fatality of no more than two individual California freshwater shrimp if less than 20 are captured or no more that 5 percent of total individuals captured if more than 20 shrimp are captured per year, for the 5-year duration of this programmatic biological opinion.

Accordingly, the Service concludes that the incidental take (injury or fatality) of California freshwater shrimp will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. death or injury of more than two individual California freshwater shrimp per site if less than 20 are captured; or
2. death or injury of more that 5 percent of total individuals captured per site if more than 20 shrimp are captured per year, for the 5-year duration of the programmatic, as detected by the FEMA Subapplicants, biological monitors, or other personnel.

Tidewater Goby

The Service anticipates that take of the tidewater goby may occur as a result of the proposed projects in and around tidewater goby habitat, but it will be difficult to detect due to the species population dynamics, life history, and ecology. The exact number of individuals taken will be difficult to quantify because tidewater goby population sizes fluctuate greatly seasonally and year-to-year and the number of occupied localities and locations varies with seasonal and stochastic events. The Service is authorizing take incidental to the proposed action in the form of capture and

relocation and take incidental to the proposed project actions in the form of death or injury of up to five percent of individuals captured and relocated per site per year, 10 percent of the estimated population as a result of project activities per site per year, and up to five percent of the estimated populations as a result of all projects per year and for the 5-year duration of the programmatic biological opinion.

Accordingly, the Service concludes that the incidental take (injury or fatality) of the tidewater goby will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. death or injury of up to 5 percent captured and relocated individuals per site per year;
2. death or injury of up to 10 percent of the estimated population as a result of project activities per site per year; and
3. death or injury of up to 5 percent of the estimated populations as a result of all projects per year and for the 5-year duration of the programmatic biological opinion.

Bay Checkerspot Butterfly, Myrtle's Blue Butterfly, Callippe Silverspot Butterfly

The Service anticipates that incidental take of the Bay checkerspot butterfly, Myrtle's silverspot butterfly and Callippe silverspot butterfly (three butterfly species) will be difficult to detect because most take will likely occur to larvae and chrysalis pupae that are on host plants, lying on the ground or underneath a plant. The finding of a damaged or crushed individual larva or chrysalis is unlikely because of its relatively small size. Adults may be killed by mechanized equipment while flying through the project area; loss of individuals of these three butterfly species also may be difficult to quantify due to their small size. However, while small, these adults are more likely to be detected than larvae or chrysalises. The Service anticipates and is authorizing a maximum of two adults of each of these three butterfly species per site per year and no more than 30 adults of each of these three butterfly species total for all sites for the 5-year duration of this programmatic biological opinion.

Accordingly, the Service concludes that the incidental take (injury or fatality) of the Bay checkerspot butterfly, Myrtle's silverspot butterfly and Callippe silverspot butterfly will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. Death or injury of more than two individual adults of each of these three butterfly species per site per year or
2. Death or injury of more than 30 individual adults of each of these three butterfly species, for the 5-year duration of this programmatic biological opinion, as detected by the FEMA Subapplicants, biological monitors, or other personnel.

Alameda Whipsnake

The Service anticipates and is authorizing take incidental to the proposed action as the injury or fatality of no more than one juvenile or adult Alameda whipsnake per year and no more than five juvenile or adult Alameda whipsnakes during the 5-year duration of this programmatic biological opinion.

Accordingly, the Service concludes that the incidental take of Alameda whipsnake will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. more than five dead or injured juvenile or adult individual Alameda whipsnakes total for all sites per year; or
2. more than 25 dead or injured juvenile or adult individual Alameda whipsnakes total for all sites during the 5-year duration of the programmatic biological opinion, as detected by the FEMA Subapplicants, biological monitors, or other personnel.

Vernal Pool Branchiopods

It is not meaningful to provide numbers for incidental take of individual conservancy fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, and longhorn fairy shrimp (collectively, vernal pool branchiopods) associated with this action because a surveyor only can count what they can see and there is much that they cannot see under the water and within the soil. Even in locations actually occupied by the species, it is possible for surveyors to miss adults, juveniles and eggs, particularly given the opportunistic and precipitation-driven life history of these species and the large size of the Action Area. All of these factors result in even the most experienced vernal pool branchiopod biologist being unable to show that any estimated take occurred or did not occur at the site. If a single individual vernal pool branchiopod has been killed or injured, there is no means of equating one dead or injured branchiopod (assuming one was found) to a number of dead or injured branchiopods not observed. Furthermore, the likelihood of detecting an injured or dead vernal pool branchiopod is extremely low due to their very small size and cryptic life history. Therefore, the Service is not quantifying take incidental to the proposed action as the injury or fatality in terms of individual animals. Incidental take for this species is provided only in terms of habitat, as described above.

Since we cannot estimate the number of individual vernal pool branchiopods that will be incidentally taken for the reasons listed above, the Service is providing a mechanism (acres) to quantify when we will consider take to be exceeded as a result of the proposed project. Since we expect take to result from the proposed project's effects to habitat, the quantification of habitat becomes a direct surrogate for the species that will be taken. Therefore, the Service anticipates that all vernal pool branchiopods inhabiting individual project footprints within the Action Area will be subject to incidental take in the form of non-lethal harm and harassment. The Service anticipates and is authorizing the take of not more than 1 acre of actual habitat at any given project site that is less than 20 acres or no more than five percent of habitat at a particular site that is 20 acres or greater. This five percent at a particular site cannot represent more than five percent of the entire range of a covered species, for the five-year term of the programmatic biological opinion.

Accordingly, the Service concludes that the incidental take of vernal pool branchiopods will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. more than 1 acre of actual habitat at any given project site that is less than 20 acres is taken;
2. more than 5 percent of habitat at a particular site that is 20 acres or greater is taken; or
3. if this 5 percent at a particular site represents more than 5 percent of the entire range of a covered species is taken, for the 5-year term of the programmatic biological opinion.

Upon implementation of the following reasonable and prudent measures, incidental take of these 17 animal species associated with FEMA's Disaster, Mitigation, and Preparedness Program in California, will become exempt from the prohibitions described in section 9 of the Act. No other forms of take are exempted under this programmatic biological opinion.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species covered by this programmatic biological opinion, or destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures

The Service has determined the following reasonable and prudent measure is necessary and appropriate to minimize incidental take of these 16 species:

1. FEMA and their Subapplicants shall fully implement and adhere to all general avoidance and minimization measures and species-specific conservation measures, as described in the programmatic biological assessment and restated here in the Description of the Proposed Programmatic Actions section of this programmatic biological opinion. Further, this reasonable and prudent measure shall be supplemented by the terms and conditions below.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the FEMA must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are nondiscretionary.

1. FEMA shall require that all personnel and Subapplicants associated with this project are made aware of the general avoidance and minimization measures and species-specific conservation measures and their responsibility to implement them fully.

2. FEMA shall submit an annual report to the Service by March 15 summarizing all projects completed during the previous calendar year. These annual reports shall include a tabular summary of those projects and for each project:

    a) Subapplicant and project name;
    b) Project location with map or GIS shape file;
    c) Covered species impacted;
    d) Estimated acres of covered species' habitat affected (acres, linear feet, etc.), as stated in the ESA Review Form;
    e) Any other pertinent information that allows the Service to evaluate the causes and extent of habitat effects and any incidental taking that may have occurred that was not authorized in the Incidental Take Statement of this programmatic biological opinion.
    f) The annual report will also include a summary of acres of habitat taken and individuals injured or killed from all previous years.
    g) FEMA shall require that the Subapplicant to provide a copy of the project report to the Service and FEMA with the following project-specific details on its respective projects within 45 days of project construction completion:

i. Date the project was initiated and completed;
ii. Number of observed instances of injury or mortality of any covered species;
iii. Number of observations of live, uninjured individuals of any covered species;
iv. Pertinent information concerning the success of the project in meeting the conservation measures; and
v. An explanation of failure to meet such measures, if any.

3. FEMA Region IX shall attend an annual coordination meeting with the Service by May 15 each year to discuss the annual monitoring report and any adaptive management measures needed to minimize impacts.

4. FEMA or its Subapplicants shall immediately contact the Service's SFWO at (916) 414-6631 to report direct encounters between listed species and project workers and their equipment whereby incidental take in the form of harm, injury, or death occurs. If the encounter occurs after normal working hours, FEMA or its Subapplicants shall contact the SFWO at the earliest possible opportunity the next working day. When injured or killed individuals of the listed species are found, FEMA or its Subapplicants shall follow the steps outlined in the Salvage and Disposition of Individuals section below.

5. For those components of the action that will require the capture and relocation of any listed species, FEMA or its Subapplicant shall immediately SFWO at (916) 414-6631 to report the action. If capture and relocation need to occur after normal working hours, FEMA or its Subapplicant shall contact the SFWO at the earliest possible opportunity the next working day.

6. FEMA or its Subapplicants shall immediately contact the Service's SFWO at (916) 414-6631 to report any unauthorized take of federally-listed species occurs onsite, or if more than one (1) acre of habitat is adversely affected at a particular site as a result of implementation of the FEMA-funded action.

Salvage and Disposition of Individuals

Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as the Service-approved biologist. Dead individuals must be sealed in a resealable plastic bag containing a paper with the date and time when the animal was found, the location where it was found and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site, until the Service provides instructions regarding the disposition of the dead specimen. The Service contact persons are Kellie Berry or Gerry Cobian at the SFWO at (916) 414-6631.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends the following action:

1. Sightings of any listed and sensitive species encountered during FEMA-funded activities should be reported to the California Natural Diversity DataBase (CNDDB), California

Department of Fish and Wildlife.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION—CLOSING STATEMENT

This concludes formal consultation on FEMA's Disaster, Mitigation, and Preparedness Programs in California. As provided in 50 CFR §402.16, reinitiation of formal consultation is required and shall be requested by the federal agency or by the Service where discretionary federal agency involvement or control over the action has been retained or is authorized by law and:

(a) If the amount or extent of taking specified in the incidental take statement is exceeded;
(b) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;
(c) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or
(d) If a new species is listed or critical habitat designated that may be affected by the identified action.

If you have any questions regarding this biological opinion, please contact Kellie Berry, Sacramento Valley Division Chief (kellie_berry@fws.gov) or Gerry Cobian, Fish and Wildlife Biologist (gerald_cobian@fws.gov) at the letterhead address or telephone (916) 414-6631.

Sincerely,

Jennifer M. Norris, Ph.D.
Field Supervisor

ec:
Ms. Nancy Haley, Chief, California North Section, U.S. Army Corps of Engineers
Mr. William Guthrie, Chief, California Delta Section, U.S. Army Corps of Engineers
Mr. Paul Maniccia, Chief, California South Section, U.S. Army Corps of Engineers

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United States Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
Ecological Services
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
08EVEN00-2018-F-0700

August 5, 2019

Alessandro Amaglio
Federal Emergency Management Agency
1111 Broadway, Suite 1200
Oakland, California 94607

Subject: Programmatic Biological Opinion for the Federal Emergency Management Agency's Disaster, Mitigation, and Preparedness Programs within the Ventura Fish and Wildlife Office's Jurisdiction

Dear Mr. Amaglio:

This document transmits the U.S. Fish and Wildlife Service's (Service) programmatic biological opinion (PBO) based on our review of the Federal Emergency Management Agency's (FEMA) Disaster, Mitigation, and Preparedness Programs in California (Program) within the Ventura Fish and Wildlife Office (VFWO) and its effects on federally listed species and critical habitats, in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (Act) (16 U.S.C. 1531 et seq.). We received your request to initiate consultation on June 21, 2018, and a letter clarifying effects determinations on September 14, 2018. At issue are the effects of FEMA's grant programs that assist with the preparedness, response, recovery, and mitigation for natural and human-caused disasters (Program) on federally-listed species and their designated critical habitats within the VFWO's jurisdiction (Table 1).

The intent of this programmatic consultation is to provide flexibility for the dynamic nature of FEMA's Program, while at the same time ensuring the necessary regulatory compliance with section 7 and ensuring projects completed under this Program are designed and implemented with trust resource conservation in mind. FEMA and the Service collaborated extensively on the Programmatic Biological Assessment (PBA), which led to FEMA's incorporation of Service feedback into development of general avoidance and minimization measures and species-specific conservation measures. This document includes: (1) a program-wide concurrence for species and critical habitats that FEMA determined are not likely to be adversely affected by any aspect of the Program, which concludes section 7 consultation for this subset of species and critical habitat; and (2) a PBO for species or critical habitats that may be affected by one or more of the specific projects within FEMA's Program.

Table 1. Federally listed species and critical habitat covered under the programmatic concurrence or the PBO.

Listed Species and Critical Habitat in VFWO Jurisdiction	Status	FEMA Determination	Service Response
[1]California least tern (*Sterna antillarum browni*)	E	May affect, not likely to adversely affect	Programmatic Concurrence
[2]Contra Costa goldfields (*Lasthenia conjugens*)	E, CH		
[1]Light-footed Ridgway's rail (*Rallus longirostris levipes*)	E		
[3]Marbled murrelet (*Brachyramphus marmoratus*)	T		
[1]Riverside fairy shrimp (*Streptocephalus woottoni*)	E, CH		
[3]Western snowy plover (*Charadrius nivosus* ssp. *Nivosus*)	T, CH		
[4]Arroyo toad (*Anaxyrus californicus*)	E, CH	May affect, likely to adversely affect	Programmatic Biological Opinion
[2]California red-legged frog (*Rana draytonii*)	T, CH		
[2]California tiger salamander (*Ambystoma californiense*) - Central California Distinct Population Segment (DPS)	T, CH		
[2]California tiger salamander (*Ambystoma californiense*) - Santa Barbara DPS	E, CH		
[2]Conservancy fairy shrimp (*Branchinecta conservatio*)	E, CH		
[2]Vernal pool fairy shrimp (*Branchinecta lynchi*)	T, CH		
[4]Tidewater goby (*Eucyclogobius newberryi*)	E, CH		
[1]Coastal California gnatcatcher (*Polioptila californica californica*)	T, CH		
[1]Least Bell's vireo (*Vireo bellii pusillus*)	E, CH		
[4]Smith's blue butterfly (*Euphilotes enoptes smithi*)	E		
[1]Southwestern willow flycatcher (*Empidonax traillii extimus*)	E, CH		
[5]Yellow-billed cuckoo (*Coccyzus americanus*), Western U.S. DPS	T		
[4]Smith's blue butterfly (*Euphilotes enoptes smithi*)	E		

E = Endangered; T = Threatened; CH = Designated Critical Habitat,
[1]Carlsbad Fish and Wildlife Office is the species lead for this species
[2] Sacramento Fish and Wildlife Office is the species lead for this species
[3]Arcata Fish and Wildlife Office is the species lead for this species
[4]VFWO is the species lead for this species
[5]Arizona Ecological Services Field Office is the species lead for this species

Your agency determined that the proposed action was not likely to adversely affect the federally Endangered California least tern, Contra Costa goldfields, light-footed Ridgway's rail, and the federally threatened marbled murrelet and western snowy plover. Based on our review of the

information provided in the PBA, we concur with FEMA's *may affect, but not likely to adversely affect* determination for those species and their respective designated critical habitat (if applicable) within the jurisdiction of the VFWO (see Appendix A for justification and Appendix B for conservation measures). Also, while you requested formal consultation for the federally Endangered Riverside fairy shrimp we have determined that the proposed action is not likely to adversely affect these species, and the basis for this determination is also documented in Appendix A. Thus, these species are not addressed further in this document.

This document is based on information provided in the following: (1) *Programmatic Biological Assessment for Disaster, Mitigation and Preparedness Programs in California*, (FEMA 2018); (2) Correspondence regarding effects determinations for the species within this consultation; (3) conversations and electronic mail correspondence between the VFWO and FEMA staff or their contracted agents; (4) conversations between FEMA and other Service biologists from the Arcata, Carlsbad, Sacramento, Ventura, and Yreka Fish and Wildlife Offices; and (5) information contained in Service files. These documents, and other information relating to the consultation, are located at the VFWO.

Consultation History

March, 2017 - May, 2018	Extensive coordination calls, correspondence exchange and meetings between FEMA and the Service.
June 21, 2018	FEMA provided a Programmatic Biological Assessment and initiated formal consultation.
June 2018 - July 2019	Continued coordination and correspondence exchange regarding effects determinations and development of the PBO.

More details regarding the history of this consultation can be found in section 1.4 of the PBA (FEMA 2018).

PROGRAMMATIC BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Scope of Consultation

This PBO addresses FEMA's disaster, mitigation and preparedness Program (proposed action) in California. By ensuring trusted resource conservation is an integral component of their Program and fulfilling the obligations within this PBO, FEMA is complying with its responsibilities under both sections 7(a)(1) and 7(a)(2) of the Act for projects that result from emergencies and are likely to adversely affect 12 federally-listed species and their respective designated critical habitat within the jurisdiction of the VFWO. However, this consultation does not cover FEMA's implementation of the National Flood Insurance Program.

This PBO will remain in effect for five years from the date it is signed. When the 5-year period has expired or if incidental take coverage under this PBO is exceeded, FEMA may reinitiate consultation under section 7 of the Act to extend or amend the coverage provided.

This PBO is intended to be adaptive in nature. The general avoidance and minimization measures and species-specific conservation measures included herein are intended to be comprehensive and designed to minimize adverse effects to the species and designated critical habitat addressed herein. We encourage feedback on any conservation measures that are not feasible or effective. If either FEMA or the VFWO wish to make changes to the conservation measures, we will work together to update them as appropriate. The VFWO will coordinate any changes to conservation measures with other Service offices as needed.

This PBO only applies to FEMA Subapplicants' proposed projects for which FEMA is the Lead Federal Agency for compliance under section 7 of the Act. When FEMA and the U.S. Army Corps of Engineers (USACE) are both involved with a Subapplicant's proposed project, the process described in the 2015 Memorandum of Understanding (MOU) (executed in 2015, updated in 2018, and subsequent annual updates) between FEMA, USACE, Service, and the National Marine Fisheries Service will be followed to determine whether FEMA or the USACE is the Lead Federal Agency for compliance with the Act.

Emergency Consultations

Actions completed by FEMA's Subapplicants as emergencies, as defined by the Service in 50 CFR 402.05 and by FEMA in 44 CFR 206.201, prior to environmental review may be covered by this PBO at FEMA's discretion, provided that the actions were consistent with the guidelines, criteria, assumptions, and intent of FEMA's June 20, 2018 PBA (FEMA 2018), as amended, and did not: (1) result in jeopardy to a species; (2) result in the destruction or adverse modification of designated critical habitat; (3) exceed the maximum allowable take authorized in the Incidental Take Statement in this PBO; or (4) was otherwise not eligible for inclusion in this PBO.

In order for FEMA to include a project categorized as an emergency under this PBO, FEMA will notify the Service of the emergency as soon as possible, either by phone or electronic mail and request the emergency action be considered for inclusion in this PBO. Within 24 hours of the notification or as soon as possible, the VFWO will provide FEMA any additional site specific conservation measures that may be needed. FEMA will provide Subapplicants all applicable general avoidance and minimization measures and species specific conservation measures listed in this PBO and any additional measures the VFWO warrants appropriate for the specific emergency. FEMA will advise Subapplicants to adhere to the measures when possible. However, if an imminent threat exists to life and/or property, under no circumstances should any measures be implemented if doing so will interfere with alleviating the emergency or placing any individual at risk of injury.

After the emergency, FEMA and the Service will follow the consultation procedures outlined below. Emergency actions conducted prior to environmental review that are subsequently

covered by this programmatic consultation will be counted towards the cumulative amount of take authorized in the Incidental Take Statement of this PBO.

Procedure to Cover Individual Projects Under this PBO

The extensive coordination between FEMA and the Service as well as FEMA's commitment to prioritize species conservation within their jurisdictional capacity while operating their disaster, mitigation, and preparedness programs in California, has resulted in a process designed to expedite project specific section 7 consultation, while at the same time, considering the landscape level needs of the species within the VFWO's jurisdiction.

To determine eligibility for coverage under this PBO, FEMA will determine if a Subapplicant's proposed project meets the suitability criteria established under the PBA (FEMA 2018). If the project meets suitability criteria, FEMA will submit a completed ESA Review Form to the Service (see Appendix C). The ESA Review Form will include a project-specific effects analysis, the applicable general and species specific conservation measures, a summary of the potential direct and indirect effects associated with the proposed project, and the anticipated take.

Upon submittal of the ESA Review Form, FEMA will request confirmation that the project meets the criteria for coverage under the PBO. The Service will notify FEMA by electronic mail whether we agree with the proposed project's coverage under the PBO or not. VFWO's intention is to process FEMA projects that meet eligibility criteria under this PBO as expeditiously as possible, striving to respond within 30 days of receipt. If this is not possible, we will notify FEMA and request more time.

FEMA will submit annual reports that summarize the projects covered under the PBO each year. This report will include a summary of incidental take that occurred and identify any issues with PBO implementation.

7(a)(1)

To meet FEMA's Section 7(a)(1) responsibility, FEMA has committed to the actions below. Additional details are discussed in Section 8 of the PBA (FEMA 2018).

- Developing procedures for implementing its disaster, mitigation, and preparedness programs within the context of listed resource conservation.
- Educating Subapplicants about species conservation and encouraging them to proactively implement conversation measures.
- Educating Subapplicants on conservation efforts at the project design and project planning levels.
- Incorporate an ecosystem services approach into FEMA's decision-making process.

Description of Proposed Programmatic Action

The proposed action is FEMA's funding of grant programs related to its disaster, mitigation, and preparedness program in California. While FEMA doesn't know exactly when or where the next emergency will occur, they have determined that most on-the-ground actions that occur under this Program are categorized as follows [additional details of the actions can be found in Section 3 of the PBA (FEMA 2018)]:

Non-Emergency Debris Removal

For purposes of this document, debris removal performed in non-emergency situations includes:

- Removing rock, silt, sediment, or woody debris that floodwaters have deposited in harbors and ports, stream channels, bridge and culvert openings, canals, sedimentation basins, sewage treatment ponds, ditches, and other facilities in such a manner as to disrupt normal flows, navigation, recreation, or municipal services;
- Removing woody debris and other vegetation following events that damage or destroy trees;
- Removing rubble after earthquakes;
- Removing rock and earth from landslides caused by events such as earthquakes or heavy rains; and
- Hauling and disposing of debris.

All removed debris will be disposed of at approved and licensed disposal sites, in compliance with existing laws and regulations. Any hazardous materials or other contaminants will be removed and disposed of in an appropriate manner. If possible, woody debris and construction materials will be recycled.

Constructing, Modifying or Relocating Facilities

FEMA is authorized to provide funds for constructing, modifying, or relocating facilities. Relevant actions include:

Airport Runway Construction

- Repairing or realigning airport runways and associated facilities;
- Constructing of new airport runways and associated facilities; and
- Managing and/or removing wildlife.

Road and Trial Construction

- Constructing or realigning new roads, trails, or boardwalks;
- Repairing or replacing damaged roads and trails, includes retaining walls, subsurface, and pavement;
- Regrading or improving gravel or dirt roads and trails; and

- Repairing, replacing, or realigning of an existing, or construction of new low-water road crossing.

Utility Construction

- Constructing, repairing, or relocating utility pipelines (e.g., potable water, sewer pipelines, natural gas, petroleum), leach fields, wastewater hookups, electrical lines (including street lighting), and telephone lines that have been damaged in floods or fires;
- Constructing, repairing, or relocating substations or other facilities needed to support utility infrastructure;
- Constructing or installing temporary utilities including associated infrastructure and facilities; and
- Installing electrical boxes for electrical transformers and switches and secondary utility boxes for telephone and cable.

Rail Line Construction

- Acquiring or decommissioning of an existing rail line;
- Realigning or modifying an existing rail line;
- Repairing or replacing ballast and track;
- Stabilizing embankments along a rail line corridor;
- Repairing or replacing fill using rock, grout, timber walls, or steel sheet piling; and
- Repairing or replacing earthen material lost during disasters.

Facility Disaster Mitigation Activities

FEMA may provide funds to implement changes required by current building codes and standards, or otherwise modify existing structures. Often, these changes make the structure more resistant to damage in future events. Typical activities include:

- Modifying structures to reduce the risk of damage during floods by elevating structures above the expected flood level or by flood-proofing;
- Making structures more fire-resistant by replacing roofs, doors, and other building components with fire-resistant materials; and
- Installing bracing, shear panels, shear walls, anchors, or other features so that structures are better able to withstand disaster events such as those associated with seismic, high wind events, or snow loads.

Building and Facility Construction

- Installing prefabricated manufactured structures (or temporary structures) including dwelling pads. Temporary facilities would be removed when no longer needed and land would be restored to original use;
- Constructing safe rooms;
- Modifying existing facilities to serve as temporary housing;
- Acquiring and demolishing existing facilities (e.g., structures and buildings) located in high-hazard areas; and

- Constructing, repairing, or relocating new facilities (e.g., wastewater treatment plants, public buildings, and certain utilities).

Actions Involving Watercourses and Coastal Features

Many FEMA funded activities pertain to inland water sources, such as streams, rivers, and lakes, as well as coastal features such as harbors and beaches. Inland water sources may be perennial or dry during the summer months. During construction, general avoidance and minimization measures and species-specific conservation measures typically will be used and incorporated as part of the action. Relevant categories of activities include the following:

Channelization

- Creating, repairing, modifying, or dredging of a waterway for non-flood control purposes.

Stormwater Management

- Constructing, repairing, replacing, or modifying a stormwater management facility and associated infrastructure, including storm drains, pipelines, and outfalls.

Flood Control Activities

- Channelizing and rechannelizing for flood control purposes;
- Dredging of sediment and debris;
- Removing vegetation, rock, silt, or woody debris. Vegetation may be removed by hand, mechanical means, or herbicides. Sediment and debris would be removed by dredging, heavy equipment, or by hand;
- Constructing, repairing, and realigning drainage swales, earthen channels, concrete channels, or subsurface concrete pipelines;
- Constructing, repairing, or replacing earthen banks or channel; and
- Constructing, repairing, or modifying levees and floodwalls.

Culvert Construction

- Increasing the size of an existing culvert or adding culvert barrels;
- Constructing, repairing, replacing, or realigning a culvert or associated structure;
- Constructing box culverts;
- Modifying the type of culvert; and
- Adding features, such as a headwall, discharge apron, or riprap, to reduce the risk of erosion or damage to a culvert.

Bridge Construction

Bridges may be modified to increase capacity to reduce the risk of flooding or to reduce the risk of damage to the crossing. Typical activities include:

- Increasing capacity to reduce the risk of flooding or to reduce the risk of damage to the crossing;

- Widening existing openings or constructing new openings;
- Reconfiguring bracing to reduce the risk that debris would be trapped;
- Repairing an existing bridge structure, including from large bridges to pedestrian bridges;
- Installing protective features, such as concrete abutments or riprap, to reduce the risk of damage due to erosion and scour; and
- Replacing a multi-span structure with a clear-span structure.

Bank Protection, Stabilization, and Erosion Control Activities

- Repairing or replacing existing or placing new rock riprap within stream channels, banks, or hillsides;
- Repairing or replacing existing or hardening new areas with concrete or soil cement;
- Repairing or replacing existing or installing new retaining walls, gabions, or geotextile fabrics;
- Constructing, repairing, or replacing bank protection, stabilization, and erosion control by using bioengineering techniques (e.g., planting vegetation, placing root wads, or placing willow bundles); and
- Temporarily diverting water during construction activities may be necessary.

Dam Construction

- Decommissioning an existing earthen or concrete dam;
- Constructing or repairing earthen or concrete dams;
- Constructing or repairing spillways;
- Constructing or repairing water diversion structures; and
- Enlarging water storage reservoirs.

Detention/Retention, or Basin Water Storage Facility Construction

- Repairing or replacing existing detention/retention basins, or sediment ponds; and
- Constructing new detention/retention basins or sediment ponds.

Linear Water Conveyance Facility Construction

- Constructing, repairing, replacing, or modifying irrigation ditches, canals, or flumes, and associated infrastructure and facilities.

Shoreline Facilities – Recreation or Maritime Use

- Constructing, repairing, replacing, or modifying boardwalks, piers, boat ramps, docks, and slips.

Shoreline Facilities – Protection

- Constructing, repairing, replacing, or modifying seawalls, groins, jetties, revetments, levees, dikes, and floodwalls;
- Repairing, modifying, or installing interior drainage systems to reduce the risk of damage behind levees and floodwalls during heavy rains or flooding events on streams;
- Repairing, modifying, or installing bank protection of a shoreline facility;

- Repairing damaged shoreline facilities;
- Constructing new facilities to protect flood-prone areas from damage during future floods;
- Raising the height of existing facilities to prevent overtopping in future floods; and
- Construction activities would occur in water and involve driving piles, placing rock or soil, or dredging sediment.

Wildfire Risk Reduction

Vegetation management is intended to reduce the risk of loss and damage due to wildfire and increase the ability of channels to convey flows, thus reducing the risk of flood damage. Some activities may include a combination of these methods. During implementation, avoidance and minimization measures will be used and incorporated as part of the action.

Defensible Space Creation and Hazardous Fuels Reduction

- Mechanical or hand-clearing of vegetation to reduce the amount of vegetative fuels in an area;
- Removing vegetation to create defensible space around buildings and structures;
- Removing of targeted exotic invasive species within specific areas with U.S. Environmental Protection Agency-approved herbicides;
- Preventing re-growth and re-sprouting of undesirable vegetation once an area has been cleared of excessive vegetation by mechanical means, herbicide treatment, and/or hand removal; and
- Some areas may be revegetated with fire resistant native vegetation.

Biological Control

In biological control, cattle, horses, goats, sheep, or other livestock are allowed to graze on grasses and other vegetation as a means of control. Any area proposed for grazing will be fenced. The type of animals, timing, duration, and stocking rate will be selected based on the targets of the vegetation management plan (i.e., the quantity and quality of residue to remain).

Proposed General Avoidance and Minimization Measures and Species-Specific Conservation Measures

The following measures will be implemented, as appropriate, to reduce potential adverse effects from a subapplicant's proposed project. The subapplicant will be responsible for implementation of any avoidance and minimization measures FEMA identifies as necessary for the proposed project. The measures listed below are intended to address a wide range of projects that could be covered by this consultation. Not all measures may be necessary for each project covered under this consultation; rather FEMA should identify the measures that are applicable to minimize the specific impacts anticipated from a particular project and require those measures to be implemented by the subapplicant.

General Avoidance and Minimization Measures

GEN AMM-1 Erosion and Sedimentation Prevention Measures: The Subapplicant will prepare an Erosion Control Plan, as needed. The Erosion Control Plan will detail the erosion and sedimentation prevention measures required. As part of this plan, the Subapplicant will ensure that sediment-control devices are installed and maintained correctly. For example, sediment will be removed from engineering controls once the sediment has reached one-third of the exposed height of the control. The devices will be inspected frequently (i.e., daily or weekly, as necessary) to ensure that they are functioning properly; controls will be immediately repaired or replaced or additional controls will be installed as necessary. Sediment that is captured in these controls may be disposed of onsite in an appropriate, safe, approved area or offsite at an approved disposal site.

Areas of soil disturbance, including temporarily disturbed areas, will be seeded with a regionally appropriate erosion control seed mixture. On soil slopes with an angle greater than 30 percent, erosion control blankets will be installed or a suitable and approved binding agent will be applied. Runoff will be diverted away from steep or denuded slopes.

Where habitat for covered species is identified within, or adjacent to, the project footprint, all disturbed soils at the site will undergo erosion control treatment before the rainy season starts and after construction is terminated. Treatment may include temporary seeding and sterile straw mulch.

GEN AMM-2 Bank Stabilization: If bank stabilization activities are necessary, then such stabilization will be constructed to minimize erosion potential and will contain design elements suitable for supporting riparian vegetation, if feasible.

GEN AMM-3 Dust Control Measures: To reduce dust, all traffic associated with the Subapplicant's construction activities will be restricted to a speed limit of 15 miles per hour when traveling off of highways or county roads.

Stockpiles of material that are susceptible to wind-blown dispersal will be covered with plastic sheeting or other suitable material to prevent movement of the material.

During construction, water or other binding materials will be applied to disturbed ground that may become windborne. If binding agents are used, all manufacturers' recommendations for use will be followed.

GEN AMM-4 Spill Control Planning: The Subapplicant will prepare a Spill Prevention and Pollution Control Plan to address the storage of hazardous materials and emergency cleanup of any hazardous material and will be available onsite, if applicable. The plan will incorporate hazardous waste, storm water, and other emergency planning requirements.

GEN AMM-5 Spill Prevention and Pollution Control Measures: The Subapplicant will exercise every reasonable precaution to protect covered species and their habitats from pollution due to fuels, oils, lubricants, construction by-products, and pollutants such as construction chemicals, fresh cement, saw-water, or other harmful materials. Water containing mud, silt, concrete, or other by-products or pollutants from construction activities will be treated by filtration, retention in a settling pond, or similar measures. Fresh cement or concrete will not be allowed to enter the flowing water of streams and curing concrete will not come into direct contact with waters supporting covered species. Construction pollutants will be collected and transported to an authorized disposal area, as appropriate, per all Federal, State, and local laws and regulations.

To reduce bottom substrate disturbance and excessive turbidity, removal of existing piles by cutting at the substrate surface or reverse pile driving with a sand collar at the base to minimize resuspension of any toxic substances is preferable; hydraulic jetting will not be used.

No petroleum product chemicals, silt, fine soils, or any substance or material deleterious to covered species will be allowed to pass into or be placed where it can pass into a stream channel. There will be no side-casting of material into any waterway.

All concrete or other similar rubble will be free of trash and reinforcement steel. No petroleum-based products (e.g., asphalt) will be used as a stabilizing material.

The Subapplicant will store all hazardous materials in properly designated containers in a storage area with an impermeable membrane between the ground and the hazardous materials. The storage area will be encircled by a berm to prevent the discharge of pollutants to ground water or runoff into the habitats of covered species. A plan for the emergency cleanup of any hazardous material will be available onsite, and adequate materials for spill cleanup will be maintained onsite.

GEN AMM-6 Equipment Inspection and Maintenance: Well-maintained equipment will be used to perform the work and, except in the case of a failure or breakdown, equipment maintenance will be performed offsite. Equipment will be inspected daily by the operator for leaks or spills. If leaks or spills are encountered, the source of the leak will be identified, leaked material will be cleaned up, and the cleaning materials will be collected and properly disposed. Fueling of land- and marine-based equipment will be conducted in accordance with procedures to be developed in the Spill Prevention and Pollution Control Plan.

Vehicles and equipment that are used during the course of a project will be fueled and serviced in a “safe” area (i.e., outside of sensitive habitats) in a manner that will not affect covered species or their habitats. Spills, leaks, and other problems of a similar nature will be resolved immediately to prevent unnecessary effects on covered species and their habitats. A plan for the emergency cleanup of any spills of fuel or other material will be available onsite, and adequate materials for spill cleanup will be maintained onsite.

GEN AMM-7 Fueling Activities: Avoidance and minimization measures will be applied to protect covered species and their habitats from pollution due to fuels, oils, lubricants, and other harmful materials. Vehicles and equipment that are used during project implementation will be fueled and serviced in a manner that will not affect covered species or their habitats. Machinery and equipment used during work will be serviced, fueled, and maintained on uplands to prevent contamination to surface waters. Fueling equipment and vehicles will be kept more than 200 feet away from waters of the United States. Exceptions to this distance requirement may be allowed for large cranes, pile drivers, and drill rigs if they cannot be easily moved.

GEN AMM-8 Equipment Staging: No staging of construction materials, equipment, tools, buildings, trailers, or restroom facilities will occur in a floodplain during flood season at the proposed project location, even if staging is only temporary.

GEN AMM-9 Materials Storage and Disposal: Stockpiled soils will be adequately covered to prevent sedimentation from runoff and wind. All hazardous materials will be stored in upland areas in storage trailers and/or shipping containers designed to provide adequate containment. Short-term laydown of hazardous materials for immediate use will be permitted provided the same containment precautions are taken as described for hazardous materials storage. All construction materials, wastes, debris, sediment, rubbish, trash, and fencing will be removed from the site once project construction is complete and transported to an authorized disposal area, as appropriate, in compliance with applicable Federal, State, and local laws and regulations. No disposal of construction materials or debris will occur in a floodplain. No storage of construction materials or debris will occur in a floodplain during flood season.

GEN AMM-10 Fire Prevention: With the exception of vegetation-clearing equipment, no vehicles or construction equipment will be operated in areas of tall, dry vegetation.

The Subapplicant will develop and implement a fire prevention and suppression plan for all maintenance and repair activities that require welding or otherwise have a risk of starting a wildfire.

GEN AMM-11 Waste Management: The work area will be kept free of loose trash, including small pieces of residual construction material, such as metal cuttings, broken glass, and hardware.

All food waste will be removed from the site on a daily basis.

All construction material, wastes, debris, sediment, rubbish, vegetation, trash, and fencing will be removed from the site once the project is completed and will be transported to an authorized disposal area, as appropriate, per all Federal, State, and local laws and regulations.

GEN AMM-12 Work Involving Boats and Barges: For projects that involve in-water work for which boats and/or temporary floating work platforms are necessary, buoys will be installed so moored vessels will not beach on the shoreline, anchor lines will not drag, and moored vessels

and buoys are not located within 25 feet of vegetated shallow waters. Temporary floating work platforms will not anchor or ground in fish spawning areas in freshwater or in eelgrass, kelp, or macro algae. To reduce the likelihood of introducing aquatic invasive species, vessels will use the State's Marine Invasive Species Program. Drip pans and other spill control measures will be used so that oil or fuel from barge-mounted equipment is properly contained.

GEN AMM-13 Work Area Designation to Minimize Disturbance: The Subapplicant will reduce, to the maximum extent practicable, the amount of disturbance at a site to the absolute minimum necessary to accomplish the project. Wherever possible, existing vegetation will be salvaged from the project area and stored for replanting after earthmoving activities are completed. Topsoil will be removed, stockpiled, covered, and encircled with silt fencing to prevent loss or movement of the soil into covered species habitats. All topsoil will be replaced in a manner to recreate pre-disturbance conditions as closely as possible.

Project planning must consider not only the effects of the action itself, but also all ancillary activities associated with the actions, such as equipment staging and refueling areas, topsoil or spoils stockpiling areas, material storage areas, disposal sites, routes of ingress and egress to the project site, and all other related activities necessary to complete the project.

GEN AMM-14 Access Routes and Staging Areas: When working on stream banks or floodplains, disturbance to existing grades and vegetation will be limited to the actual site of the project and necessary access routes. Placement of all roads, staging areas, and other facilities will avoid and limit disturbance to sensitive habitats (e.g., stream banks, stream channel, and riparian habitat) as much as possible. When possible, existing ingress or egress points will be used and/or work will be performed from the top of the stream banks. After completion of the work, the contours of the streambed, vegetation, and stream flows will be returned to their pre-construction condition or better.

All staging and material storage areas, including the locations where equipment and vehicles are parked overnight, will be placed outside of the flood zone of a watercourse, above areas of tidal inundation, away from riparian habitat or wetland habitat, and away from any other sensitive habitats. When possible, staging and access areas will be situated in areas that are previously disturbed, such as developed areas, paved areas, parking lots, areas with bare ground or gravel, and areas clear of vegetation.

GEN AMM-15 Environmental Awareness Training for Construction Personnel: All construction personnel will be given environmental awareness training by the project's environmental inspector or biological monitor before the start of construction. The training will familiarize all construction personnel with the covered species that may occur onsite, their habitats, general provisions and protections afforded by the Act, measures to be implemented to protect these species, and the project boundaries. This training will be provided within three days of the arrival of any new worker.

As part of the environmental awareness training, construction personnel will be notified that no dogs or any other pets under control of construction personnel will be allowed in the construction area, and that no firearms will be permitted in the construction area, unless carried by authorized security personnel or law enforcement.

GEN AMM-17[1] Daily Work Hours: Construction activities that may affect suitable habitat for covered species will be limited to daylight hours during weekdays, leaving a nighttime and weekend period for the species. Work will be allowed on weekends if the proposed construction is 14 days or less in length.

GEN AMM-18 Entrapment Prevention: To prevent entrapment of covered species, all vertically sided holes or trenches will be covered at the end of the workday, or have escape ramps built into the walls of the excavation. If pipes are stored onsite or in associated staging areas, they will be capped when not in use.

Construction materials that have the potential to entangle or entrap wildlife will be properly contained so that wildlife cannot interact with the materials.

If a covered species is identified onsite, crews will immediately stop work within 50 feet of the individual, and inform the construction supervisor and the VFWO-approved biologist. Work will not continue within 50 feet of the individual until it has traveled off the project site of its own volition. For covered species, please refer to the species-specific Conservation Measures section of the PBO.

GEN AMM-19 Water Quality Protection: Contractors will exercise every reasonable precaution to protect covered species and their critical habitats from construction byproducts and pollutants, such as construction chemicals, fresh cement, saw-water, or other deleterious materials. Fresh cement or uncured concrete will not be allowed to come into contact with any waterway. Construction waste will be collected and transported to an authorized upland disposal area, as appropriate, and per Federal, State, and local laws and regulations.

The Subapplicant will follow the best management practices described in *The Use of Treated Wood Products in Aquatic Environments* guidelines (NOAA Fisheries 2009). Although this guidance focuses on the effects of the contaminants on Pacific salmonids protected under the Act, this guidance may still apply for general water quality protection and other federally-protected species. This guidance will be used in conjunction with site-specific evaluations of other potential impacts. Riprap will be clean and durable, free from dirt, sand, clay, and rock fines and will be installed to withstand the 100-year flood event. If applicable, appropriate measures will be taken to minimize disturbance to potentially contaminated sediments.

1 The general avoidance and minimization measures for this PBO are consistent with other programmatic biological opinions for FEMA's Program within the state of California, but whose actions fall within other Service field office jurisdiction. For consistency in numbering with other field offices, when the VFWO needed to modify a general avoidance or minimization measure, the measure was given a new number. This may create an appearance of mis-numbering within these measures.

GEN AMM-20 Revegetation of Stream Banks: For projects that require revegetation of stream and river banks as a result of riparian vegetation removal during project activities, the Subapplicant will implement revegetation techniques. Where such revegetation is needed, the Subapplicant will prepare and implement a revegetation plan that includes information regarding monitoring for success. Revegetation plantings will be replaced at a 3:1 ratio with an 80 percent planting survival within 5 years of the plantings.

GEN AMM-21 Restoration of Upland Areas to Pre-Project Conditions: For projects that require restoration of upland areas to pre-project conditions as a result of ground disturbance during project activities, the Subapplicant will use native plants to the maximum extent practicable. Similarly, when hydroseeding, only native seed mix will be used.

GEN AMM-22 Invasive Aquatic Species: The Subapplicant will follow the guidelines in the California Department of Fish and Wildlife's (CDFW's) *California Aquatic Invasive Species Management Plan* to prevent the spread of invasive aquatic plant and animal species (CDFW 2008).

Construction equipment will be clean of debris or material that may harbor seeds or invasive pests before entering the work area. This debris or material includes dirt on construction equipment, tools, boots, pieces of vegetation, and water in the bilge of boats. All aquatic sampling equipment will be sterilized using appropriate guidelines before its use in aquatic habitats.

GEN AMM-23 Work below Mean Higher High Water: In freshwater, estuarine, and marine areas that support covered species, disturbance to habitat below mean higher high water will be limited to the maximum extent possible.

GEN AMM-24 Avoidance of Submerged Vegetation: The removal of submerged vegetation (such as eelgrass and kelp estuarine or marine areas, or submerged aquatic vegetation in freshwater areas) will be avoided to the maximum extent possible.

GEN AMM-25 Minimization of Shading by Overwater Structures: To reduce shading effects, new and replacement structures placed over freshwater, estuarine, and marine waters (such as bridges, piers, floating docks, and gangways) will incorporate design elements (such as metal grating or glass paver blocks) that allow light transmission when feasible.

GEN AMM-26 Water Diversion and Dewatering: In-channel work and channel diversion of live flow during project construction will be conducted in a manner to reduce impacts to covered species. Dewatering will be used to create a dry work area and will be conducted in a manner that minimizes turbidity into nearby waters. Water diversion and dewatering will include the following measures:

a. Heavy equipment will avoid flowing water other than temporary crossing or diverting activities.

b. If covered species may be present in the areas to be dewatered, relocation will be conducted by a VFWO-approved biologist in accordance with applicable species-specific Conservation Measures. Because this measure involves take of a species, it is only applicable to covered species for which an Incidental Take Statement is provided.
c. Water pumped or removed from dewatered areas will be treated before its release so that it does not contribute to turbidity in nearby waters.
d. Temporary culverts to convey live flow during construction activities will be placed at stream grade and be of an adequate size as to not increase stream velocity.
e. Silt fences or mechanisms to avoid sediment input to the flowing channel will be erected adjacent to flowing water if sediment input to the stream may occur.

GEN AMM-27 Biological Monitor: If a project involves activities that are likely to result in adverse effects of a species or critical habitat addressed in this PBO, a VFWO-approved biologist will be present onsite for all site preparation (e.g. vegetation removal, soil disturbance) and construction activities that occur within 100 feet of habitat for those species. If a VFWO-approved biologist is needed, the Subapplicant will submit biologist qualifications to us for approval 30 days prior to the initiation of activities that require biologist presence.

Approval requests will include, at a minimum, the following:

a. Relevant education;
b. Training received from a permitted biologist or recognized species expert concerning the listed species for which approval is requested. This training should include species identification, survey techniques, and handling protocols for individuals of different lifestages;
c. A description of field experience with the species for which approval in requested conducting requested activities (to include project/research information);
d. Any previous biological opinions or authorizations under which they were approved to work with the requested species. For any such projects, include the following:
    i. The type of activities were performed (e.g., construction monitoring, handling);
    ii. The names and qualification of supervising biologist under which the work was completed, and;
    iii. The amount of work experience on the actual project.
e. A list of Federal section 10(a)1(A)recovery permits held or under which they are authorized to work with the requested species requested (to include the permit number, authorized activities and name of permit holder); and
f. At least two professional references with contact information.

This biologist will ensure that all applicable general avoidance and minimization measures and species-specific conservation measures in the PBO are implemented. S/he will also ensure that all vehicles entering the site are free of debris that may harbor organisms that could be introduced to the site, such as vegetation or mud from other aquatic areas. The VFWO-approved

biologist will also ensure that turbidity, sedimentation, and the release of materials such as dust or construction runoff are controlled, and that spill control measures are enacted properly.

The VFWO-approved biologist will oversee construction activities to ensure that no covered species and/or their habitats are adversely affected. The VFWO-approved biologist will have the authority to stop any work activities that may result in potential adverse effects to covered species and/or their habitats.

GEN AMM-28 Landscape level conservation planning: When the VFWO has an existing landscape level plan or conservation strategy in use for a specific species, FEMA and Subapplicants will ensure projects activities are carried out in a manner consistent with such plans. The VFWO will ensure any project-specific recommendations are communicated in a timely manner.

Species-specific Conservation Measures

In cases where the species-specific conservation measures are duplicative of the General Conservation Measures, the most comprehensive measure (i.e., the measure providing the most protections for listed species and critical habitat) will apply.

Conservation Measures for Arroyo Toad

ARTO-1 Habitat Assessment: A habitat assessment will be conducted by a VFWO-approved biologist to determine whether suitable habitat for the arroyo toad occurs in the Action Area. If suitable habitat for this species is identified in the Action Area and the proposed project may affect suitable habitat that is not known to be occupied by the arroyo toad, the VFWO will be contacted regarding the need for surveys according to Service protocol and those surveys will be conducted, as appropriate. With VFWO concurrence, FEMA may also forgo surveys by making a determination that suitable habitat is occupied for the purposes of section 7 consultation.

ARTO-2 Amphibian Protection Guidelines: A capture and relocation plan for arroyo toads will be implemented during activities in occupied habitat using a VFWO-approved biologist(s). Biologists must follow the Declining Amphibian Task Force's Fieldwork Code of Practice to prevent the spread of pathogens.

ARTO-3 Seasonal Avoidance: To minimize direct effects to breeding arroyo toads, all project activities within designated critical habitat, occupied habitat, or potential suitable habitat will occur outside the breeding season (i.e., the breeding season is March 15 - July 15 for arroyo toad). If the breeding season cannot be avoided and arroyo toads are found to occur within the Action Area, a VFWO-approved biologist will conduct daily surveys prior to project work within the Action Area until the beginning of the non-breeding season or project activities have ceased. If the breeding season cannot be avoided, a VFWO-approved biologist will conduct surveys no more than 48 hours prior to project work, if no arroyo toads of any life stages or clutches are found to occur within the Action Area, project activities may proceed.

ARTO-4 Preconstruction Surveys: If a project is located in designated critical habitat, occupied, or potential suitable habitat for the arroyo toad, a VFWO-approved biologist must conduct preconstruction surveys no more than 48 hours prior to project work to determine if arroyo toads are present in the Action Area.

ARTO-5 Heavy Machinery Limitations: If a project is located 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 - October 1).

ARTO-6 Biological Monitor: A VFWO-approved biological monitor with the authority to stop work will monitor project activities within areas occupied habitat. The biological monitor will search the Action Area daily for arroyo toads.

ARTO-7 Capture and Relocation: Implement a capture and relocation plan for arroyo toads on the project site using a VFWO-approved biologist(s). Biologists must follow the Declining Amphibian Task Force's Fieldwork Code of Practice to prevent the spread of pathogens.

ARTO-8 Avoidance of Occupied Habitat: No permanent impacts will occur to arroyo toad occupied habitat, habitat determined to be occupied through surveys or otherwise by FEMA, or designated critical habitat unless the impacts to habitat are determined to be insignificant via project-level consultation with the VFWO (i.e., small permanent impacts that will have a negligible effect on habitat quality for arroyo toad). Temporary impacts to arroyo toad habitat are restricted to 1 acre per project and 10 acres overall.

ARTO-9 Environmental Awareness Training: Conduct environmental awareness training for all workers regarding the arroyo toad and other listed species in the Action Area. This training may be conducted by the biological monitor or VFWO-approved biologist, if present.

ARTO-10 Site Restrictions: The following site restrictions will be implemented to avoid or minimize effects on the listed species and its habitat:

a. A speed limit of 15 miles per hour (mph) in the project footprint in unpaved areas will be enforced to reduce dust and excessive soil disturbance;
b. Construction and ground disturbance will occur only during daytime hours, and will cease no less than 30 minutes before sunset and may not begin again earlier than 30 minutes after sunrise.;
c. Except when necessary for driver or pedestrian safety, to the maximum extent practicable, artificial lighting at a project site will be prohibited during the hours of darkness;
d. Routes and boundaries of roadwork will be clearly marked prior to initiating construction or grading;
e. To the maximum extent practicable, any borrow material will be certified to be non-toxic and weed free;

f. Remove all external oil, grease, dirt, plant parts, and mud from equipment prior to arriving at the Action Area and inspect all equipment before unloading at the Action Area;
g. All food and food-related trash items will be enclosed in sealed trash containers and properly disposed of offsite; and
h. No pets will be allowed anywhere in the Action Area during construction.

ARTO-11 Rain Event Limitations: To the maximum extent practicable, no construction activities will occur during rain events or within 24 hours following a rain event. Prior to construction activities resuming, a VFWO-approved biologist will inspect the Action Area and all equipment/materials for the presence of arroyo toads. Construction may continue 24 hours after the rain ceases if no precipitation is forecasted within 24-hours. If rain exceeds 0.25 inches during a 24-hour period, work will cease until no further rain is forecasted. The Service may approve modifications to this timing on a case-by-case basis.

ARTO-12 Designated staging areas: Use designated staging areas more than 100 feet from riparian areas to perform vehicle maintenance and refueling. Conduct daily checks of equipment for leaks and correct problems before entering aquatic or riparian areas. Infiltrate as much runoff from these areas using permeable surfaces and infiltration ditches or basins in areas where groundwater contamination risk is low. Restore staging areas immediately following use. Effectively prevent access to the area once site restoration activities have been completed.

ARTO-13 Delineate work areas: Clearly delineate work areas and access routes to reduce impacts to the surrounding area and use only existing transportation routes, as feasible.

ARTO-14 Erosion and Sedimentation Control: Implement Best Management Practices to control erosion and sedimentation such as:

a. Use temporary filters, berms, barriers, conveyances, or other materials to collect sediment and prevent it from entering surface waters.
b. Accurately establish and preserve horizontal alignment for each stream-crossing structure, to assure that flows do not erode stream banks or shoreline. For project activities conducted within stream banks, ensure the stream channel alignment and depth is preserved in such a manner as to not cause the streambank or channel to erode.
c. Restore the original surface of the streambed upon decommissioning the concrete crossing, when applicable.
d. Keep excavated materials out of channels, floodplains, wetlands, and lakes.
e. Install silt fences or other sediment –and-debris-retention barriers between the water body and construction material stockpiles and wastes.
f. Remove all project debris from the creek and do not stockpile materials within the creek.
g. Dispose of unsuitable material in approved waste areas. Ensure that project debris will not enter any waterway, and construction materials will not be stockpiled within 50 feet of the waterway.

h. Stabilize decommissioned surfaces and other disturbed soil surfaces by retaining or reestablishing soil cover to 60 to 70 percent. Use certified weed-free straw where existing soil cover is insufficient. Stabilize work areas in an identical manner when the National Weather Service predicts a 30 percent or greater chance of precipitation (predicted precipitation greater than 0.25 inches within a 24-hour period).

ARTO-15 Maintain Vegetation: Native woody riparian vegetation will not be cut or removed, except where needed to facilitate project implementation. Maintain vegetation where practicable to provide adequate shade for riparian habitat.

ARTO-16 Containment of spills: Implement procedures for containment and removal of any chemical spills (for example a Water Pollution Control and Prevention Plan). Use liners as needed to prevent seepage to groundwater. Remove residues, waste oil, and other materials from the site and properly dispose of them. Hazardous materials must be stored at safe distances from riparian or aquatic areas within a designated location designed to contain spills. Report spills and initiate appropriate clean-up action in accordance with applicable State and Federal laws, rules, and regulation.

ARTO-17 Restoration to Pre-Disturbance Conditions: Restore all temporarily disturbed areas within the Action Area to pre-disturbance or better conditions immediately following completion of project activities. Effectively prevent access to the restored area once site restoration activities have been completed.

Conservation Measures for California Red-Legged Frog and California Tiger Salamander, Central California and Santa Barbara DPS

CRLF-CTS-1 Biological Monitor: A VFWO-approved biologist(s) will be onsite during all activities that may result in take of California red-legged frogs or California tiger salamanders.

CRLF-CTS-2 Seasonal Avoidance: Project activities will be scheduled to minimize adverse effects to the California red-legged frog and California tiger salamander and their habitat. Disturbance to upland habitat will be confined to the dry season, generally May 1 through October 15 (or the first measurable fall rain of 1" or greater) because that is the time period when California red-legged frogs and California tiger salamanders are less likely to be moving through upland areas. However, if seasonal avoidance is not possible, conduct grading and other disturbance in pools and ponds only when they are dry, typically between July 15 and October 15. Work within a pool or wetland may begin prior to July 15 if the pool or wetland has been dry for a minimum of 30 days prior to initiating work.

CRLF-CTS-3 Rain Event Limitations: To the maximum extent practicable, no construction activities will occur during rain events or within 24 hours following a rain event. Prior to construction activities resuming, a VFWO-approved biologist will inspect the Action Area and all equipment/materials for the presence of California red-legged frogs and California tiger salamanders. Construction may continue 24 hours after the rain ceases if no precipitation is

forecasted within 24-hours. If rain exceeds 0.5 inches during a 24-hour period, work will cease until no further rain is forecasted. The Service may approve modifications to this timing on a case-by-case basis.

CRLF-CTS-4 Pre-construction Survey: No more than 24 hours prior to the date of initial ground disturbance and vegetation clearing, a VFWO-approved biologist with experience in the identification of all life stages of the California red-legged frog and California tiger salamander and designated critical habitat will conduct a pre-construction survey at the project site. The survey will consist of walking the project limits and within the project site to determine possible presence of the species. The VFWO-approved biologist will investigate all areas that could be used by California red-legged frogs and California tiger salamanders for feeding, breeding, sheltering, movement, and other essential behaviors, such as small woody debris, refuse, burrows, etc.

CRLF-CTS-5 Daily Clearance Surveys: The VFWO-approved biologist will conduct clearance surveys at the beginning of each day and regularly throughout the workday when construction activities are occurring that may result in take of California red-legged frogs and California tiger salamanders.

CRLF-CTS-6 Environmentally Sensitive Areas: Prior to the start of construction, Environmentally Sensitive Areas (ESAs) – defined as areas containing sensitive habitats adjacent to or within construction work areas for which physical disturbance is not allowed – will be clearly delineated using high visibility orange fencing. The ESA fencing will remain in place throughout the duration of the proposed action, while construction activities are ongoing, and will be regularly inspected and fully maintained at all times. The final project plans will depict all locations where ESA fencing will be installed and will provide installation specifications. The bid solicitation package special provisions will clearly describe acceptable fencing material and prohibited construction-related activities including vehicle operation, material and equipment storage, access roads and other surface-disturbing activities within ESAs. With prior approval from the Service, a hybrid ESA/Wildlife Exclusion Fencing (WEF)[2] fencing material that is both hi-visibility and impermeable to wildlife movement may be used in place of paired ESA fencing and WEF fencing. Also with prior approval from the Service, an exception to the foregoing fencing measures may apply on a case-by-case basis during the following situations: (1) at work sites where the duration of work activities is very short (e.g., 3 days or less), the work activities occur during the dry season, and the installation of ESA fencing will result in more ground disturbance than from project activities; or (2) at work sites where the substrate (i.e., rock, shale, etc.) or topography (i.e., slopes > 30 degrees) inhibit the safe and proper installation of fencing materials. In these cases, biological monitoring will occur during all project activities at that site.

CRLF-CTS-7 Wildlife Exclusion Fencing: Prior to the start of construction, Wildlife Exclusion Fencing (WEF) will be installed at the edge of the project footprint in all areas where California red-legged frogs and California tiger salamanders could enter the construction area. The onsite

2 See CRLF-CTS-7 for information regarding WEF.

Project Manager and the VFWO-approved biologist will determine location of the fencing prior to the start of staging or surface disturbing activities.

a. Exclusion fencing will be at least 3 feet high and the lower 6 inches of the fence will be buried in the ground to prevent animals from crawling under. The remaining 2.5 feet will be left above ground to serve as a barrier for animals moving on the ground surface.
b. Such fencing will be inspected and maintained daily by the VFWO-approved biologist until completion of the project and removed only when all construction equipment is removed from the site.
c. The WEF specifications will be included in the final project plans and in the bid solicitation package (special provisions) and will include the WEF specifications including installation and maintenance criteria.
d. The WEF will remain in place throughout the duration of the project and will be regularly inspected and fully maintained. Repairs to the WEF will be made within 24 hours of discovery.
e. Upon project completion the WEF will be completely removed, the area cleared of debris and trash, and returned to natural conditions.
f. With prior approval from the Service, an exception to the foregoing fencing measures may apply on a case-by-case basis during the following situations: 1) at work sites where the duration of work activities are very short (e.g., 3 days or less), the work activities occur during the dry season, and the installation of exclusion fencing will result in more ground disturbance than from project activities; or (2) at work sites where the substrate (i.e., rock, shale, etc.) or topography (i.e., slopes > 30 degrees) inhibit the safe and proper installation of fencing materials. In these cases, species monitoring will occur during all project activities at that site. Modifications to this fencing measure may be made on a case-by-case basis with approval from the Service.

CRLF-CTS-8 Entrapment Prevention: To prevent inadvertent entrapment of animals during construction, all excavated, steep-walled holes or trenches more than 6 inches deep will be covered with plywood or similar materials at the close of each working day or provided with one or more escape ramps constructed of earth fill or wooden planks. The VFWO-approved biologist will inspect all holes and trenches at the beginning of each workday and before such holes or trenches are filled. All replacement pipes, culverts, or similar structures stored in the Action Area overnight will be inspected before they are subsequently moved, capped, and/or buried. If at any time a California red-legged frog or California tiger salamander is discovered, the onsite Project Manager and VFWO-approved biologist will be notified immediately and the VFWO-approved biologist will implement the species observation and handling protocol. If handling is necessary, work will be suspended until the appropriate level of coordination is complete.

CRLF-CTS-9 Encounters with Species: Each encounter with a California red-legged frog or California tiger salamander will be treated on a case-by-case basis. If any life stage of the California red-legged frog or California tiger salamander is found and these individuals may be killed or injured by work activities, the following will apply:

a. If California red-legged frogs or California tiger salamanders are detected in the Action Area, work activities within 50 feet of the individual that may result in the harm, injury, or death to the animal will cease immediately and the onsite Project Manager and VFWO-approved biologist will be notified. Based on the professional judgment of the VFWO-approved biologist, if project activities can be conducted without harming or injuring the California red-legged frog and California tiger salamander, it may be left at the location of discovery and monitored by the VFWO-approved biologist. All project personnel will be notified of the finding and at no time will work occur within 50 feet of a California red-legged frog or California tiger salamander without a VFWO-approved biologist present.
b. To the maximum extent possible, contact with the individual frog or salamander will be avoided and it will be allowed to move out of the hazardous situation of its own volition. This procedure applies to situations where a California red-legged frog or California tiger salamander is encountered while it is moving to another location. It does not apply to animals that are uncovered or otherwise exposed or in areas where there is not sufficient adjacent habitat to support the species if the individual moves away from the hazardous location. Such individuals must be relocated per Conservation Measure CRLF-CTS-10.

CRLF-CTS-10 Species Observations and Handling Protocol: If a California red-legged frog or California tiger salamander does not leave the work area, the VFWO-approved biologist will implement the species observation and handling protocol outlined below. Only VFWO-approved biologists will participate in activities associated with the capture, handling, relocation, and monitoring of California red-legged frogs and California tiger salamanders.

a. Prior to handling and relocation, the VFWO-approved biologist will take precautions to prevent 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 (Service and CDFW 2003). Disinfecting equipment and clothing is especially important when biologists are coming to the Action Area to handle amphibians after working in other aquatic habitats. California red-legged frogs and California tiger salamanders will also be handled and assessed according to the Restraint and Handling of Live Amphibians (USGS National Wildlife Health Center 2001).
b. California red-legged frogs and California tiger salamanders will be captured by hand, dip net, or other VFWO-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. CTS individuals will be relocated no greater than 300 feet outside of the project site to areas with an active rodent burrow or burrow system (unless otherwise approved by the Service and with written landowner permission). CRLF individuals will be relocated to the nearest area of dense riparian cover outside the project site. Holding/transporting containers and dip nets will be thoroughly cleaned, disinfected, and rinsed with freshwater prior to use within the Action Area and between project sites within the Action Area. The Service will be notified within 24 hours of all capture, handling, and relocation efforts.

c. If an injured California red-legged frog or California tiger salamander is encountered and the VFWO-approved biologist determines the injury is minor or healing and the animal is likely to survive, it will be released immediately, consistent with measure b, above. Any injured California red-legged frogs and California tiger salamanders will be monitored until it is determined that they are not imperiled by predators or other dangers.
d. If the VFWO-approved biologist determines that a California red-legged frog or California tiger salamander has major or serious injuries as a result of project-related activities the VFWO-approved biologist, or designee, will immediately take it to a VFWO-approved facility. 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 the Service. The Subapplicant will bear any costs associated with the care or treatment of such injured California red-legged frogs or California tiger salamanders. 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 the Service as described below.
e. Notification to the Service of an injured or dead California red-legged frog or California tiger salamander in the Action Area will be made and reported whether or not its condition resulted from project-related activities. In addition, the VFWO-approved biologist will follow up with the Service in writing within 2 calendar days of the finding. Written notification to the Service will include the following information: the species, number of animals taken or injured, sex (if known), date, time, 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 observed 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 the Service regarding the disposition of the specimen.

CRLF-CTS-11 Environmental Awareness Training: Prior to the start of construction, a VFWO-approved biologist with experience in the ecology of the California red-legged frog and California tiger salamander as well as the identification of all its life stages will conduct a training program for all construction personnel including contractors and subcontractors. Interpretation for non-English speaking workers will be provided. All construction personnel will be provided a fact sheet conveying this information. The same instruction will be provided to any new workers before they are authorized to perform project work. The training will include, at a minimum:

a. habitat within the Action Area;
b. an explanation of the species status and protection under state and Federal laws;
c. the avoidance and minimization measures to be implemented to reduce take of this species;

d. communication and work stoppage procedures in case a listed species is observed within the Action Area; and
e. an explanation of the importance of the ESAs and WEF.

CRLF-CTS-12 Disease Prevention and Decontamination Procedures: To ensure that diseases are not conveyed between work sites by the VFWO-approved biologist, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times.

CRLF-CTS-13 Pump Screens: If a water body is to be temporarily dewatered by pumping, intakes will be completely screened with wire mesh not larger than 5 millimeters and the intake will be placed within a perforated bucket or other method to attenuate suction to prevent California red-legged frogs and California tiger salamanders from entering the pump system. Pumped water will be managed in a manner that does not degrade water quality and upon completion be released back into the water body, or at an appropriate location in a manner that does not cause erosion. No re-watering of the water body is necessary if sufficient surface or subsurface flow exists to fill it within a few days, or if work is completed during the time of year the water body will have dried naturally. To avoid effects to eggs and larvae, work within seasonal ponds will be conducted when the pond has been dry naturally for at least 30 days

CRLF-CTS-14 Hand Clear Vegetation: Hand clear vegetation in areas where California red-legged frogs and California tiger salamanders are suspected to occur. All cleared vegetation will be removed from the project footprint to prevent attracting animals to the project site. A VFWO-approved biologist will be present during all vegetation clearing and grubbing activities. Prior to vegetation removal, the VFWO-approved biologist will thoroughly survey the area for California red-legged frogs and California tiger salamanders. Once the VFWO-approved biologist has thoroughly surveyed the area, clearing and grubbing may continue without further restrictions on equipment; however, the VFWO-approved biologist will remain onsite to monitor for California red-legged frogs and California tiger salamanders until all clearing and grubbing activities are complete. The Service may approve modifications to this conservation measure on a case-by-case basis.

CRLF-CTS-15 Wildlife Passage for Road Improvement: When constructing a road improvement, wherever possible, enhance or establish wildlife passage for the California red-legged frog and California tiger salamander across roads, highways, or other anthropogenic barriers. This includes upland culverts, tunnels, and other crossings designed specifically for wildlife movement, as well as making accommodations in curbs, median barriers, and other impediments to terrestrial wildlife movement at locations most likely beneficial to the California red-legged frog and California tiger salamander.

CRLF-CTS-16 Accidental Spills, SWPPP, Erosion Control, and BMPs: Prior to the onset of work, a plan will be in place for prompt and effective response to any accidental spills. All workers will be informed of the importance of preventing spills and of the appropriate measures to implement if a spill occurs. Storm-water pollution prevention plans and erosion control BMPs

will be developed and implemented to minimize any wind- or water-related erosion. These provisions will be included in construction contracts for measures to protect sensitive areas and prevent and minimize storm-water and non-storm-water discharges. Protective measures will include, at a minimum:

a. No discharge of pollutants from vehicle and equipment cleaning is allowed into any storm drains or watercourses.
b. Vehicle and equipment fueling and maintenance operations must be at least 50 feet away from aquatic or riparian habitat and not in a location where a spill may drain directly toward aquatic habitat, except at established commercial gas stations or at an established vehicle maintenance facility. The monitor will implement the spill response plan to ensure contamination of aquatic or riparian habitat does not occur during such operations.
c. Concrete wastes will be collected in washouts and water from curing operations is to be collected and disposed of properly. Neither will be allowed into watercourses.
d. Spill containment kits will be maintained onsite at all times during construction operations and/or staging or fueling of equipment.
e. Dust control will be implemented, and may include the use of water trucks and non-toxic tackifiers (binding agents) to control dust in excavation and fill areas, rocking temporary access road entrances and exits, and covering of temporary stockpiles when weather conditions require.
f. Graded areas will be protected from erosion using a combination of silt fences, fiber rolls, etc. along toes of slopes or along edges of designated staging areas, and erosion control netting (such as jute or coir) as appropriate on sloped areas.
g. Permanent erosion control measures such as bio-filtration strips and swales to receive storm water discharges from paved roads or other impervious surfaces will be incorporated to the maximum extent practicable.
h. All grindings and asphaltic-concrete waste will be stored within previously disturbed areas absent of habitat and at a minimum of 50 feet from any aquatic habitat, culvert, or drainage feature.

CRLF-CTS-17 Site Restrictions: The following site restrictions will be implemented to avoid or minimize effects on the listed species and its habitat:

a. A speed limit of 15 miles per hour (mph) in the project footprint in unpaved areas will be enforced to reduce dust and excessive soil disturbance.
b. Construction and ground disturbance will occur only during daytime hours, and will cease no less than 30 minutes before sunset and may not begin again earlier than 30 minutes after sunrise.
c. Except when necessary for driver or pedestrian safety, to the maximum extent practicable, artificial lighting at a project site will be prohibited during the hours of darkness.
d. Routes and boundaries of roadwork will be clearly marked prior to initiating construction or grading.

e. To the maximum extent practicable, any borrow material will be certified to be non-toxic and weed free.
f. All food and food-related trash items will be enclosed in sealed trash containers and properly disposed of offsite.
g. No pets will be allowed anywhere in the Action Area during construction.

CRLF-CTS-18 Suitable Erosion Control Materials: To prevent California red-legged frogs and California tiger salamanders from becoming entangled, trapped, or injured, erosion control materials that use plastic or synthetic monofilament netting will not be used within the Action Area. 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 movement of the California red-legged frog and California tiger salamander.

CRLF-CTS-19 Limitation on Insecticide/Herbicide Use: Insecticides or herbicides will not be applied at the project site during construction where there is the potential for these chemical agents to enter creeks, streams, waterbodies, or uplands that contain habitat for the California red-legged frog and California tiger salamander.

CRLF-CTS-20 Limitation on Rodenticide Use: No rodenticides will be used at the project site during construction or long-term operational maintenance in areas that support suitable upland habitat for the California red-legged frog and California tiger salamander.

CRLF-CTS-21 Invasive Non-Native Plant Species Prevention: The VFWO-approved biologist will ensure that the spread or introduction of invasive non-native plant species, via introduction by arriving vehicles, equipment, imported gravel, and other materials, will be avoided to the maximum extent possible. When practicable, invasive non-native plants in the Action Area will be removed and properly disposed of in a manner that will not promote their spread. Areas subject to invasive non-native weed removal or disturbance will be replanted with appropriate mix of fast-growing native species. Invasive non-native plant species include those identified in the California Invasive Plant Council's (Cal-IPC) Inventory Database, accessible at: www.cal-ipc.org/ip/inventory/index.php.

CRLF-CTS-22 Removal of Diversion and Barriers to Flow: Upon 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 to the maximum extent possible; any imported material will be removed from stream beds upon completion of the project.

CRLF-CTS-23 Removal of Non-Native Species: A VFWO-approved individual will permanently remove, from within the Action Area, any individuals of non-native species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible. The Subapplicant is responsible for ensuring that these activities are in compliance with the California Fish and

Game Code. No conversion of seasonal breeding aquatic habitat to perennial aquatic breeding habitat is allowed under this PBO. Creating new perennial water bodies in the vicinity of California red-legged frog or California tiger salamander populations where the ponds could be colonized by predators will also be avoided. Larval mosquito abatement efforts will be avoided in occupied breeding habitat for the California red-legged frog and California tiger salamander.

CRLF-CTS-24 Restore Contours of Temporarily Disturbed Areas: Habitat contours will be returned to their original configuration at the end of project activities in all areas that have been temporarily disturbed by activities associated with the project, unless the Subapplicant and the Service determine that it is not feasible or modification of original contours will benefit the California red-legged frog and California tiger salamander.

CRLF-CTS-25 Use of Native Plants for Revegetation: Plants used in revegetation will consist of native riparian, wetland, and upland vegetation suitable for the area. Locally collected plant materials will be used to the extent practicable. This measure will be implemented in all areas disturbed by activities associated with the project, unless the Subapplicant and the Service determine that it is not feasible or practical.

CRLF-CTS-26 Practices to Prevent Pathogen Contamination in Revegetation and Restoration: The Subapplicant will refer to the following restoration design considerations and practices to help prevent pathogen contamination in revegetation and restoration as published by the Working Group for *Phytophthora* in Native Habitats in order to address the risk of introduction and spread of *Phytophthora* and other plant pathogens in site plantings:

a. Design restoration with lower initial plant density. Planting large quantities of nursery plants increases the likelihood that some of those plants may be infested with *Phytophthora* or other plant pathogens. The greater the number of plants installed the higher the risk for pathogen introduction. The closer the plants are to one another the higher the likelihood of pathogen spread.
b. To the extent possible, use direct seeding of native plant seeds or cuttings instead of container stock. Planting locally-collected seeds or cuttings rather than installing container stock can minimize the risk of introducing pathogens to a site.
c. Ensure the use of clean nursery stock. To prevent and manage the introduction and spread of *Phytophthora* and other plant pathogens during revegetation and restoration activities, it is essential that projects use clean nursery stock grown with comprehensive best management practices.
d. Prevent contamination in site preparation, installation, and maintenance. Implementing best management practices to prevent pathogen introduction and spread is also critical during all other phases of revegetation and restoration to reduce contamination risk. For detailed guidance on how to prevent and manage *Phytophthora* during various aspects of restoration, including nursery plant production, see The Phytophthora in Native Habitats Work Group “Restoration Guidance” at www.calphytos.org.
e. Reduce the potential for pathogen spread and introduction due to movement or use of non-sanitized vehicles, tools, footwear or inadvertent use of contaminated materials (e.g.

soil erosion protection wattles and mulch, or non-sanitized materials recycled from other projects such as rebar, fencing materials, etc.). Fundamental principles include:

i. Minimize project footprint and soil disturbance. Keep the number of vehicle pass-throughs and other disturbances during site activities to the least necessary. Avoid visits when conditions are wet, and areas are muddy. Park vehicles in designated staging areas.
ii. Follow sanitation practices. *Phytophthora* and many other pathogens move when contaminated soil is transferred on vehicle tires, footwear, on contaminated tools or infested plant materials. Follow sanitation best management practices: tools, boots, and vehicles will be visibly free of soil before and after use.
iii. Promote prevention through education. Ensure that onsite personnel are aware of the risk of inadvertent pathogen introductions and understand how to prevent pathogen introduction and spread. A pre-project meeting that provides appropriate BMP training to all workers and oversight managers who will be onsite during the project will help avoid confusion and delays in the field and will ensure in advance that everyone understands the project goals related to pathogen prevention.

CRLF-CTS-27 Burrow excavation: Rodent burrows will be avoided to the maximum extent possible. Burrows that cannot be avoided and fall within the project right-of-way, but not subject to ground disturbing activities (e.g., grading, disking, excavating, etc.) should be protected using steel plates or plywood to avoid collapsing the burrows. Plates and plywood should only be used on burrows that may be run over by equipment. Plywood should only be used for lighter equipment such as pickup trucks; plates should be used for all heavier construction equipment. Plates and plywood will not be left in place for: (1) more than 48 hours; (2) when a significant rain event is forecasted within 24 hours; or (3) if work is scheduled to cease for consecutive days.

Burrow excavation should only occur on burrows that are located within areas that are subject to ground disturbing activities. The applicant will retain VFWO-approved biologist(s) to conduct burrow excavation. The biologist(s) will be allowed sufficient time to excavate burrows and relocate California tiger salamander to a suitable relocation site. The biologist will scope and excavate small mammal burrows within the impact area prior to the initiation of ground disturbing activities. The biologist(s) will utilize a fiber optic scope or similar device to scope the burrows to determine if California tiger salamander are present; burrow excavation will proceed after the burrow has been scoped. If the biologist is unable to scope the entire length of the burrow, the burrow will be scoped and excavated in sections. For example, if the scope can only reach the first 3 feet of a burrow, excavation will only occur along those 3 feet. The biologist will then scope the next 3 feet before that is excavated and so on and so forth until the end of the burrow is reached or the burrow leaves the area subject to ground disturbance. Burrow excavation may be performed using hand tools or via gentle excavation using construction equipment, under the direct supervision of a VFWO-approved biologist, until it is certain that the burrows are unoccupied or the burrow navigates to areas that are not subject to ground disturbing activities.

CRLF-CTS-28 Species Specific Conservation Strategies: The VFWO has an existing conservation strategy for Santa Barbara Distinct Population Segment of the California tiger salamander. FEMA will ensure Subapplicant project activities are consistent with the conservation strategies before submitting projects to the VFWO for inclusion in this PBO (see Appendix D).

Conservations Measures for Conservancy Fairy Shrimp and Vernal Pool Fairy Shrimp

The following conservation measures apply to any suitable fairy shrimp habitat within the VFWO's jurisdiction. For the purposes of this PBO, suitable fairy shrimp habitat includes the basin/inundation feature where fairy shrimp and/or resting eggs would be found, and the area of the watershed needed to support the feature(s).

LLBR-1 Pre-activity Surveys: Prior to any site disturbance (e.g., vegetation removal, soil disturbance) in suitable fairy shrimp habitat or initiation of construction activities, a VFWO-approved biologist with demonstrable experience with the diversity of habitat types in which listed branchiopod species can occur will conduct a habitat assessment survey. The intent of this survey is to provide information regarding the likelihood that potential habitat for one or more of the listed branchiopod species is present within, or immediately adjacent to, the project footprint. As part of this assessment, if inundated features are present, their quality and suitability for occupation by one or more of these species will be included. If, based on the results of the habitat assessment, species presence is likely, FEMA or the project applicant will contact the VFWO regarding the need for surveys according to current Service guidance. Modification to this guidance may be allowed if pre-approved by the VFWO. If it is not feasible to conduct surveys, the species presence will be assumed for all suitable habitat in the project area.

LLBR-2 Designated Critical Habitat: A maximum of five (5) percent of habitat containing Physical and Biological Features (PBFs) within designated critical habitat for vernal pool fairy and/or Conservancy fairy shrimp will be affected within the action area during the five year duration of this PBO, with a maximum of one (1) acres to be affected by activities associated with an individual project. Affected areas will be restored to pre-disturbance or improved topographic conditions and upland areas revegetated with native plant species consistent with the surrounding habitat.

LLBR-3 Occupied/Inundation Area Habitat Avoidance: Impacts to basin/inundation areas known or presumed occupied by one or more of the species and likely to contain resting eggs will be avoided.

LLBR-4 Habitat Supporting Occupied Habitat: Impacts to watershed areas that support occupied or presumed occupied basin/inundation features will be avoided to the maximum extent possible. If avoidance is not possible, the remaining conservation measures will be implemented as applicable.

LLBR-5: Exclusion Zones: Disturbance exclusion zones will be established, maintained, and monitored by the VFWO-approved biologist to ensure that impacts to basin/inundation features watershed, and/or critical habitat do not extend beyond the identified project footprint.

LLBR-6 Monitoring: A VFWO-approved biologist will monitor all site preparation (e.g., soil disturbance, vegetation removal) and/or construction activities within 250 feet of fairy shrimp habitat to ensure that there are no impacts to either inundation feature/basin. No permanent impacts to fairy shrimp habitat will occur. Actions that result in permanent alteration of the hydrology that supports inundation/basin features (e.g., construction of culverts, v-ditches, berms, roads, will could divert flows) must be avoided as they have not been analyzed and are not addressed in this programmatic consultation.

LLBR-7 Buffer Areas: All equipment storage, fueling, cleaning, maintenance, and mixing of pesticides, herbicides, or other potentially toxic chemicals is restricted to an area at least 300 feet from any basin/inundation features. Hazardous material absorbent pads must be present onsite and made easily accessible in the event of a spill.

LLBR-8: Work Restrictions – Dry Season: To the maximum extent possible, site preparation and construction activities will be restricted to the dry season (generally considered to be between June 1 and October 15) and occur only under conditions when soil is dry to the touch at the surface and to a depth of 2.5 cm (1 in.). The Service may approve modifications to this timing on a case-by-case basis. The following measures will be established and enforced:

- There will be no soil disturbing activities or herbicide application in a basin/inundation feature or within 25 feet of such a feature;
- There will be no held herbicide application within 50 feet of a basin/inundation feature;
- There will be no power spray herbicide application within 100 feet of a basin/inundation feature; and
- There will be no broadcast herbicide application within 150 feet of a basin/inundation feature.

LLBR-9 Work Restrictions -- Wet Season: If it is not possible to restrict site preparation and/or construction activities to the dry season, the following measures will be established and enforced:

- A VFWO-approved biologist will monitor all site preparation, construction, and/or maintenance activities to occur within 150 feet of a basin/inundation feature;
- Exclusion fencing and erosion control materials will be installed under the supervision of a VFWO-approved biologist to prevent the discharge of sediment into basin/inundation features;
- There will be no soil disturbing activities or manual clearing of vegetation in or within 50 feet of a basin/inundation feature;
- There will be no mechanical clearing of vegetation within 100 feet of a basin/inundation feature;
- There will be no hand-held herbicide application within 25 feet of the edge of a basin/inundation feature; and

- There will be no power spray or broadcast herbicide application within 150 feet of a basin/inundation feature.

LLBR-10 Best Management Practices: The following practices will be implemented within or immediately adjacent to fairy shrimp habitat:

- Implementation of erosion control measures that will protect basin/inundation features from siltation and contaminant runoff. Erosion-control materials will be composed of a tightly woven natural fiber netting or similar material that will not entrap other wildlife species.
- Erosion control materials cannot be comprised of plastic or microfilament netting and all fiber rolls and hay bales used for erosion control must be certified as free of noxious weed seed.
- There will be no application of water (e.g., for dust suppression) within 100 feet of a basin/inundation feature without the use of additional protective measures (e.g., barriers and/or use of low flow water truck nozzles) to keep this type of water out of these features.
- All refueling, maintenance, and staging of equipment and vehicles is restricted to those areas specifically designed to contain any spills. These activities will not occur in any location where spill materials could drain towards a basin/inundation feature.
- Vehicles will be inspected daily for fluid leaks before leaving a staging area.

LLBR-11 Invasive Nonnative Plant Species Prevention: The VFWO-approved biologist will ensure that the spread or introduction of invasive nonnative plant species, via introduction by arriving vehicles, equipment, imported gravel, and other materials, is avoided to the maximum extent possible. Construction vehicles will be certified clean prior to any work within 150 feet of fairy shrimp habitat to minimize the introduction of invasive nonnative plant species, As practicable, nonnative plant species present within the project area will be removed from the site. Disposal will be in a manner that will not promote their spread to other areas. Invasive nonnative species are those identified in the California Invasive Plant Council's (Cal-IPC) Inventory Database, accessible at: www.cal-ipc.org/ip/inventory/index.php.

LLBR-12 Habitat Restoration/Revegetation: Restoration of temporary impacts to topography and vegetation will occur in accordance with a restoration plan reviewed and approved by the VFWO prior to the initiation of project activities. Plant species used in revegetation efforts will consist of native species suitable for the area. Locally collected plant materials will be used to the extent practicable.

Conservation Measures for Tidewater Goby

TWG-1 Block Netting: Prior to initiation of dewatering or sediment removal work, a qualified biologist will install 1/8 inch block nets outside the impact areas and across the stream a minimum of 20 feet above and below the locations proposed for excavation. If widely separated sites are involved, more than one set of block nets will be placed to protect the work area. The

nets will be installed on the first day of work and monitored thereafter for the duration of the work.

TWG-2 Environmental Awareness Training: Prior to initiation of dewatering or sediment removal work, hold an environmental awareness training to inform maintenance and management personnel about tidewater gobies, including tidewater goby protected status, proximity to the project site, avoidance/minimization measures to be implemented during the particular project, and the implications of violating the Act and FEMA funding conditions.

TWG-3 Capture and Relocation: Once the block nets are secured, a VFWO-approved biologist(s) will remove all tidewater gobies found between the block nets using a 1/8 inch seine and dip nets, and relocate tidewater gobies to suitable habitat downstream of the Action Area.

TWG-4 Flagging Construction Areas: Clearly flag the limits of construction areas to avoid or minimize impacts to adjacent riparian and upland habitat. Flagging will be no more than 50 feet apart and will be clearly visible to construction workers on the ground and to operators on heavy equipment.

TWG-5 Erosion and Sedimentation Control: Implement erosion and sedimentation control measures (e.g., silt fences, straw bales or wattles) in all areas where disturbed substrate may potentially wash into waters via rainfall or runoff, particularly around stockpiled material and at the downstream end of each project reach. Such measures will remain in place and be inspected periodically until the project is complete and exposed soils are stabilized. Diversion structures, sediment traps/basins and associated equipment (e.g., pumps, lines) will be maintained in optimal working condition for the entire duration of the preparation and construction periods.

TWG-6 Biological Monitoring: A VFWO-approved biological monitor will remain onsite and search for tidewater gobies and assess turbidity levels within the work areas during all dewatering activities, and will capture and relocate tidewater gobies to suitable habitat as necessary.

TWG-7 Daily Netting, Surveying, and Capture/Relocation: If excavation of a given extent of a basin cannot be completed in one day, a new set or successive sets of block nets will be deployed each day, and subsequent surveys and capture/relocation performed accordingly. Fish released from one day's work will not be released into areas projected to be excavated on successive days.

TWG-8 Reporting: Provide a written summary of work performed (including biological survey and monitoring results), best management practices implemented (i.e., use of biological monitor, flagging of work areas, erosion and sedimentation controls) and supporting photographs of each stage. Furthermore, the documentation describing listed species surveys and re-location efforts (if appropriate) will include name of biologist(s), location and description of area surveyed, time and date of survey, all survey methods used, a list and tally of all sensitive animal species observed during the survey, a description of the instructions/recommendations given to the

applicant during the project, and a detailed discussion of capture and relocation efforts (if appropriate).

Conservation Measures for Coastal California Gnatcatcher

CAGN-1 Habitat Assessment: A habitat assessment will be conducted by a VFWO-approved biologist to determine whether suitable habitat (including foraging, nesting, and dispersal) for the gnatcatcher occurs in the action area. If suitable habitat for this species is identified in the action area and the proposed project may affect suitable habitat that is not known to be occupied by the gnatcatcher, the VFWO will be contacted regarding the need for surveys according to the Service protocol and those surveys will be conducted, as appropriate. With VFWO concurrence, FEMA may also forgo surveys by making a determination that suitable habitat is occupied for the purposes of this PBO.

CAGN-2 Seasonal Avoidance: To minimize direct effects to nesting gnatcatchers, all clearing of vegetation within occupied or designated critical habitat (gnatcatcher habitat) will occur outside the breeding season (February 15-August 30) to the maximum extent practicable. If the breeding season cannot be avoided, a VFWO-approved biologist will conduct preconstruction nesting bird surveys prior to vegetation removal. If no active nests are found to occur within 300 feet of the area of disturbance, project activities may proceed.

CAGN-3 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 non-breeding season or the following will apply:

a. An exclusionary buffer will be established around the nest. The buffer distance will be determined by the VFWO-approved biologist considering several factors: presence of natural buffers (vegetation/topography), nest height, location of foraging territory, nature of the proposed activities, and baseline levels of noise and human activity. The buffer may range from 50 feet to over 300 feet in width; AND
b. If an exclusion zone is established, a VFWO-approved biologist will monitor the nest during construction for signs of adverse effects including distress/disturbance. If adverse effects are detected, then the VFWO-approved biologist will have the authority to stop all construction activating in the vicinity of the nest and coordinate with the VFWO to determine whether additional conservation measures can avoid or minimize effects on the nesting birds. Construction may resume only with approval from the VFWO; OR
c. The biologist will continue to monitor the nest and will determine when young have fledged. Once young have left the nest the buffer and exclusion zone may be removed and construction activities within these areas may resume.

CAGN-4 Habitat Avoidance: Project impacts will be avoided or minimized in coastal sage scrub, alluvial fan scrub, and other vegetation communities known to be occupied by the gnatcatcher. Staging and temporary construction areas will be located outside of suitable habitat and will use existing roads and developed areas to the maximum extent possible. If impacts to

these habitats cannot be avoided, effects to gnatcatcher individuals will be avoided or minimized through implementation of the measures listed above.

CAGN-5 Habitat Restoration Plan: Prior to construction, a Restoration Plan will be prepared that describes the efforts to restore all the areas that had temporary impacts on suitable habitat for the gnatcatcher. Restoration of temporary impacts will occur in accordance with a VFWO-approved restoration.

CAGN-6 Limits on Habitat Disturbance: For any specific project, temporary impacts on occupied or designated critical habitat for the gnatcatcher will be limited to a maximum of 1 acre. Temporary impacts from all the projects covered under this programmatic consultation will also be limited to a maximum of 20 acres of gnatcatcher occupied or designated critical habitat. In addition, impacts will be limited to 10 gnatcatcher territories.

CAGN-7 No Permanent Loss of Habitat: No permanent loss of occupied or designated critical habitat for the gnatcatcher will occur.

Conservation Measure for Riparian birds: Least Bell's vireo, southwestern willow flycatcher, and yellow-billed cuckoo

RB – 1 Habitat Assessment and Seasonal Avoidance: A habitat assessment will be conducted by a VFWO-approved biologist to determine whether suitable habitat (including foraging, nesting, and dispersal) for listed riparian birds occurs in the action area. If suitable habitat for these species is present within 500 feet of the action area, project activities will be scheduled to avoid the breeding season (March 15 to September 15) to the maximum extent possible.

RB – 2 Pre-activity surveys: In the event that project activities in suitable habitat for least Bell's vireos, southwestern willow flycatchers, and/or yellow-billed cuckoo (riparian birds) cannot be scheduled outside of the breeding season surveys will be conducted according to Service guidance to determine presence or absence of the covered riparian birds. A modified survey protocol may be appropriate on a case-by-case basis and must be approved by VFWO.

RB – 3 Biological Monitor: A VFWO-approved biologist(s) will be onsite during all activities that may result in take of covered riparian birds.

RB – 4 Establishment of Buffer: If a nesting riparian bird is detected within the project area during pre-project surveys, a VFWO-approved biologist will establish a buffer zone around the nest that they deem sufficient to avoid the abandonment of the nest by the adults. The Service generally recommends a minimum 500 foot buffer around nests where no work is to occur; however, a smaller buffer can be established for least Bell's vireos if deemed protective by the VFWO-approved biologist and approved by the Service. Southwestern willow flycatchers and yellow-billed cuckoos are more sensitive to disturbance than least Bell's vireos, and therefore a greater buffer may be required. The VFWO-approved biologist must monitor the nests during all project activities immediately adjacent to buffer zones to determine the effects of project

activities on the nesting riparian birds. The VFWO-approved biologist will have the authority to stop work if deemed necessary to protect the nesting birds.

RB – 4 Native Vegetation Remains in Place: For projects where non-native plant species are targeted for removal within suitable habitat for riparian birds, native vegetation will be left in place to the maximum extent practical; willows (*Salix* sp.) and cottonwoods (*Populus* sp.) with a diameter at breast height of 6 inches or greater may be trimmed, but will be left in place where possible.

RB - 5 Establishment of A VFWO-Approved Restoration Plan: Prior to construction, a Restoration Plan will be prepared that describes the efforts to restore all the areas of suitable habitat for the vireo that were temporarily impacted. The Restoration Plan will be reviewed and approved by the VFWO.

RB - 6 Acreage Restriction: For any specific project, temporary impacts on occupied or designated critical habitat for listed riparian birds will be limited to a maximum of 1 acre.

RB - 7 No Permanent Habitat Loss: No permanent loss of occupied or designated critical habitat for listed riparian birds will occur unless the impacts to habitat are determined to be insignificant via project-level consultation, or are mitigated as approved by the VFWO.

Conservation Measures for Smith's Blue Butterfly

SBB-1 Habitat Avoidance: If possible, avoid damage or removal of seacliff buckwheat (*Eriogonum parvifolium*) or coast buckwheat (*Eriogonum latifolium*) plants, which are essential components of Smith's blue butterfly habitat.

SBB-2 Seasonal Restrictions: If possible, avoid work between June 15 and September 15, when Smith's blue butterfly adults, eggs, and larvae may be present. Pupae may be present throughout the year, but are immobile and unlikely to be present far from seacliff buckwheat or coast buckwheat plants.

SBB-3 Minimize Ground Disturbance: Ensure that ground disturbance for maintenance or project activities will not occur within stands of buckwheat unless a VFWO-approved biologist is on site.

SBB-4 Pre-Activity Surveys: For maintenance work or project activity within stands of buckwheat, a VFWO-approved biologist will survey the work site no more than 30 days before the onset of ground disturbance. If any life stage of the Smith's blue butterfly or its host plants, seacliff or coast buckwheat, is found and is likely to be killed or injured by work activities, the approved biologist will be allowed sufficient time to relocate seacliff or coast buckwheat plants, duff, and/or soil, from the site before work activities begin. The seacliff or coast buckwheat plants, duff, and/or soil will be hand removed and placed as close as possible to, but not on, living seacliff or coast buckwheat plants. The VFWO-approved biologist will relocate the

seacliff or coast buckwheat plants, duff, and/or soil the shortest distance possible to a location that contains suitable habitat and will not be affected by activities associated with the proposed project. The VFWO-approved biologist will maintain detailed records of the number of seacliff or coast buckwheat plants that are moved and submit with project reporting.

SSB-5 Biological Monitoring: A VFWO-approved biologist will be present at the work site for maintenance or project activity within stands of buckwheat until all Smith's blue butterflies and seacliff or coast buckwheat plants that are at risk due to project activities have been removed, workers have been instructed, and disturbance to habitat has been completed. After this time, a biological monitor on-site will ensure compliance with all protective measures. The VFWO-approved biologist will ensure that this monitor receives the training outlined in measure 7 and in the identification of the Smith's blue butterfly and its host plant, seacliff or coast buckwheat. If the biological monitor or the VFWO-approved biologist recommends that work be stopped because the Smith's blue butterfly, or seacliff or coast buckwheat would be affected to a degree that exceeds the levels anticipated by the Service during review of the proposed action, they will notify the resident engineer (the engineer that is directly overseeing and in command of construction activities) immediately. The resident engineer will either resolve the situation by eliminating the unanticipated effect(s) immediately, or require that all actions causing these effects be halted. If work is stopped, the Service will be notified as soon as is reasonably possible.

SSB-6 Capture and Relocation: If suitable habitat has been identified in the Action Area, ensure that only VFWO-approved biologists will participate in capture, handling, and monitoring of the Smith's blue butterfly, in all of its life stages, and the handling of buckwheat plants.

SSB-7 Environmental Awareness Training: Before any maintenance or project activity work begins within stands of buckwheat, VFWO-approved biologist will provide construction awareness training to all field personnel. At a minimum, the training will include a description of the Smith's blue butterfly and its habitat, the specific measures that are being implemented to conserve the Smith's blue butterfly, and boundaries within which the project may be accomplished. Brochures, books, and briefings may be used in the training session, provided that a qualified person is on hand to answer any questions.

SSB-8 Minimize Disturbing Activities: The number of access routes, size of staging areas, and the total area of the activity will be limited to the minimum necessary to achieve the project goal. Environmentally Sensitive Areas will be established to confine access routes and construction areas to the minimum area necessary to complete construction, and minimize the impact to Smith's blue butterfly and seacliff or coast buckwheat.

SSB-9 Revegetation: An assemblage of native species will be used for revegetation of project sites. Seacliff or coast buckwheat seed or plants will only be placed outside the vegetation control areas. The spread of invasive weeds during revegetation efforts will be controlled.

SBB-10 Erosion and Sedimentation Control: Ensure that best management practices are implemented according to the most current approved guidelines to control erosion and sedimentation during and after project implementation. Under the California Interagency Noxious Weed Free Forage and Mulch Program (http://pi.cdfa.gov/weed/wff), California is taking steps to make noxious weedfree hay and straw widely available. Under this program, weed-free hay and straw bales will be used for erosion control measures when they become available.

ANALYTICAL FRAMEWORK FOR THE JEOPARDY AND ADVERSE MODIFICATION DETERMINATIONS

Jeopardy Determination

Section 7(a)(2) of the Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02).

The jeopardy analysis in this biological opinion relies on four components: (1) the Status of the Species, which describes the range-wide condition of the 12 covered species, the factors responsible for that condition, and its survival and recovery needs; (2) the Environmental Baseline, which analyzes the condition of the covered species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the covered species; (3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the covered species; and (4) the Cumulative Effects, which evaluates the effects of future, non-Federal activities, that are reasonably certain to occur in the action area, on the covered species.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the current status of the covered species, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to reduce appreciably the likelihood of both the survival and recovery of the covered species in the wild by reducing the reproduction, numbers, and distribution of that species.

Adverse Modification Determination

Section 7(a)(2) of the Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to destroy or to adversely modify designated critical habitat. A

final rule revising the regulatory definition of “destruction or adverse modification” was published on February 11, 2016 (81 FR 7214). The final rule became effective on March 14, 2016. The revised definition states:

“Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features.”

The “destruction or adverse modification” analysis in this biological opinion relies on four components: (1) the Status of Critical Habitat, which describes the range-wide condition of the critical habitat in terms of the key components (i.e., essential habitat features, primary constituent elements, or physical and biological features) that provide for the conservation of the listed species, the factors responsible for that condition, and the intended value of the critical habitat overall for the conservation/recovery of the listed species; (2) the Environmental Baseline, which analyzes the condition of the critical habitat in the action area, the factors responsible for that condition, and the value of the critical habitat in the action area for the conservation/recovery of the listed species; (3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated and interdependent activities on the key components of critical habitat that provide for the conservation of the listed species, and how those impacts are likely to influence the conservation value of the affected critical habitat; and (4) Cumulative Effects, which evaluate the effects of future non-Federal activities that are reasonably certain to occur in the action area on the key components of critical habitat that provide for the conservation of the listed species and how those impacts are likely to influence the conservation value of the affected critical habitat.
For purposes of making the “destruction or adverse modification” determination, the Service evaluates if the effects of the proposed Federal action, taken together with cumulative effects, are likely to impair or preclude the capacity of critical habitat in the action area to serve its intended conservation function to an extent that appreciably diminishes the rangewide value of critical habitat for the conservation of the listed species. The key to making that finding is understanding the value (i.e., the role) of the critical habitat in the action area for the conservation/recovery of the listed species based on the Environmental Baseline analysis.

STATUS OF THE SPECIES AND CRITICAL HABITAT

A final rule published on February 11, 2016 (81 FR 7414), removed the phrase “primary constituent elements” (PCEs) from the regulations for designating critical habitat (50 CFR 424.12). Instead, new designations will focus on “physical and biological features” (PBFs). Existing critical habitat rules may still define PCEs; however, the two terms (PBFs and PCEs) may be used interchangeably as they are considered synonymous.

Arroyo Toad

Legal Status

The arroyo toad was listed as endangered on December 16, 1994 (Service 1994a). The recovery plan for the arroyo toad was published in 1999 (Service 1999). The final rule for revised critical habitat for the arroyo toad was published on February 9, 2011 (Service 2011a). The Service received a petition to downlist the arroyo toad from endangered to threatened on December 19, 2011. After reviewing the available information, the Service determined the petitioned action was not warranted (Service 2015b). Furthermore, we found that the species had not yet responded to conservation efforts to an extent that would allow a change in listing status, therefore, the species remains listed as endangered.

Natural History

The arroyo toad is a small, stocky, warty toad that is about 2 to 3.5 inches (4.6 to 8.6 centimeters) in length (Stebbins 2003). The arroyo toad is a dark-spotted toad of the family *Bufonidae* that is found along medium-to-large streams in coastal and desert drainages in central and southern California, and Baja California, Mexico (Service 2015a). It occupies aquatic, riparian, and upland habitats in a number of the remaining suitable drainages within its range. Suitable habitat for the arroyo toad is created and maintained by the fluctuating hydrological, geological, and ecological processes that naturally occur in riparian ecosystems and adjacent uplands. Campbell et al. (1996) describes that a stream must be large enough for channel scouring processes to operate, but not so large that habitat structure is lost after floods. Arroyo toads require habitat produced and maintained by narrow drainages of intermediate size; in larger systems, suitable microhabitats may be too widely dispersed, if present at all, while stream channels are too unstable in smaller systems (Campbell et al. 1996; Sweet 1992). Arroyo toads tend to be located in areas where the stream is still bordered by low hills and the stream gradient is low due to accumulated bed load (Campbell et al. 1996). Periodic flooding that modifies stream channels, redistributes channel sediments, and alters pool location and form, coupled with upper terrace stabilization by vegetation, is required to keep a stream segment suitable for arroyo toads.

The substrate in habitats preferred by arroyo toads consists primarily of sand, fine gravel, or pliable soil, with varying amounts of large gravel, cobble, and boulders. Areas that are damp and have less than 10 percent vegetation cover provide the best conditions for juvenile survival and rapid growth of the arroyo toad (Campbell et al. 1996). During the breeding season, from late March to June, arroyo toads strongly favor shallow, sand- or gravel- based pools with a minimum of vegetation along one or both margins (Sweet 1992). Larvae occupy shallow areas of open streambeds on substrates ranging from silt to cobble, with preferences for sand or gravel. Newly metamorphosed arroyo toads and juveniles remain on sparsely vegetated sand and gravel bars bordering the natal pool to feed until the pool dries out, usually from 8 to 12 weeks, but up to 4 months depending on the pool site and rainfall conditions (Service 2015a).

Arroyo toads must be able to move between the stream and upland foraging sites, as well as up and down the stream corridor. Juveniles and adult arroyo toads require and spend much of their lives in riparian and upland habitats adjacent to breeding locations (Campbell et al. 1996). Riparian habitats used for foraging and burrowing include sand bars, alluvial terraces, and streamside benches that lack vegetation, or are sparsely to moderately vegetated. Upland habitats used by arroyo toads during both the breeding and non-breeding seasons include alluvial scrub, coastal sage scrub, chaparral, grassland, and oak woodland (Holland 1995; Griffin et al. 1999).

Arroyo toad tadpoles eat microscopic algae, bacteria, and protozoans, which live in the interstices of the substrate such as the spaces among pebbles, gravel, and sand, or abraded from stones (Sweet 1992). Small toads feed almost exclusively on ants. Toads in the size range of 17-23 millimeters feed on fewer ants and an increasing proportion of small beetles, particularly ladybugs (*Coccinellidae*; Sweet 1992). When foraging, arroyo toads are often found around the drip lines of oak trees. These areas often lack vegetation, yet have levels of prey that will support arroyo toads. Toads in the size range of 17-23 millimeters are mostly diurnal, but also begin to be active after dark (Sweet 1992). Mid July to early August, when toads typically reach 22-23 millimeters (in 4-5 weeks), many of the breeding pools and surfaces of the sand bars become dry and cemented by minerals deposited in the surface layer. Toads of this size seem to be largely nocturnal at most sites, though some individuals are active diurnally on sand bars that remain damp (Sweet 1992). Nocturnal activity peaks soon after dark, and consists mostly of toads traveling to the edges of the sand bar where they soak up water before returning to their burrows (Sweet 1992). Additionally, arroyo toads may seek temporary shelter under rocks or debris and have been found in mammal burrows on occasion. Adult arroyo toads are known to burrow between 2-4 inches deep in the substrate (Sweet 1992), while juveniles burrow about 1-2 inches (Sweet 1992).

The arroyo toad has specialized breeding habitat requirements. When warm, rainy conditions occur in January, February and March, arroyo toads become active and begin to forage on stream terraces and in channel margins. Male toads sit on the substrate in shallow water to call and their throats must be above the water's surface. Female arroyo toads lay their eggs in water less than four inches deep (Sweet 1992), but not greater than seven inches deep, over substrates of sand, gravel, or cobble in open sites such as overflow pools, old flood channels, and shallow pools along streams. Breeding usually begins in late March at lower elevations, but male calling peaks in early- to mid-April and extends through late-May, sometimes even into late-June (Sweet 1992). Streams where arroyo toads breed can be either intermittent or perennial streams that typically have periodic flooding events to scour vegetation and replenish fine sediments. Such habitats rarely have closed canopies over the lower banks of the stream channel due to periodic flood events. Heavily shaded pools are generally unsuitable for larval and juvenile arroyo toads because of lower water and soil temperatures and poor algal mat development (Service 2015b).

Female arroyo toads release their entire clutch of eggs as a single breeding effort and it is very doubtful that any produce two clutches in a single mating season (Sweet 1992; Campbell et al. 1996). Larvae usually hatch in four to six days (Sweet 1992) and tadpoles disperse from the pool margin into the surrounding shallow water, where they spend an average of ten weeks (Sweet

1992). Metamorphosis from tadpole to juvenile typically occurs in June or July. After metamorphosis, the juvenile arroyo toads remain on the bordering gravel bars until the pool dries out, which can take from eight to twelve weeks, depending on whether the site remains wet and the surrounding sand or gravel bars do not become cemented by evaporate deposits (Sweet 1992). Most males become sexually mature by the following spring, but females generally do not become sexually mature until at least two years of age (Service 2015a; Sweet 1992). Longevity may vary with local conditions; comparative size data from the Santa Ynez population suggested that few adults survive even to age 5 (Sweet 1992).

Rangewide Status

The species was once relatively abundant across its range, but populations have declined by approximately 76 percent from its historical distribution (Jennings and Hayes 1994). The primary threats to the arroyo toad at the time of listing were habitat destruction and alteration from water storage reservoirs, flood control structures, roads, agriculture, urban development, recreational facilities, and mining activities. Non-native plants, such as tamarisk (*Tamarix* spp.) and giant reed (*Arundo donax*), have also altered arroyo toad habitat. In addition to habitat threats, introduced non-native predators (e.g., bullfrogs (*Rana catesbeiana*), green sunfish (*Lepomis cyanellus*), and African clawed frogs (*Xenopus laevis*)) and fire are substantial threats to the arroyo toad. Threats to the arroyo toad identified subsequent to listing are the chytrid fungus disease (*Batrachochytrium dendrobatidis*), climate change, and wildfire suppression activities (e.g., fire line construction, bulldozing, and water withdrawals by helicopters).

Critical Habitat

The final rule for revised critical habitat for the arroyo toad was published on February 9, 2011 (Service 2011a). Approximately 98,366 acres of habitat, distributed into 21 units are located throughout Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, Orange and San Diego Counties, California. This final revised designation constitutes an increase of approximately 86,671 acres from the 2005 designation of critical habitat for the arroyo toad (Service 2005a). The Service (2011) used current knowledge of the biology and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, to determine that the arroyo toad's PBFs are:

1) Rivers or streams with hydrologic regimes that supply water to provide space, food, and cover needed to sustain eggs, tadpoles, metamorphosing juveniles, and adult breeding toads.

2) Riparian and adjacent upland habitats, particularly low-gradient (typically less than 6 percent) stream segments and alluvial streamside terraces with sandy or fine gravel substrates that support the formation of shallow pools and sparsely vegetated sand and gravel bars for breeding and rearing of tadpoles and juveniles; and adjacent valley bottomlands that include areas of loose soil where toads can burrow underground, to provide foraging and living areas for juvenile and adult arroyo toads.

3) A natural flooding regime, or one sufficiently corresponding to natural, that: (1) is characterized by intermittent or near-perennial flow that contributes to the persistence of shallow pools into at least mid-summer; (2) maintains areas of open, sparsely vegetated, sandy stream channels and terraces by periodically souring riparian vegetation; and (3) also modifies stream channels and terraces and redistributes sand and sediment, such that breeding pools and terrace habitats with scattered vegetation are maintained.

4) Stream channels and adjacent uplands habitats that allow for movement to breeding pools, foraging areas, overwintering sites, upstream and downstream dispersal, and connectivity to areas that contain suitable habitat.

In summary, the need for space for individual and population growth and normal behavior is met by PBFs 1 and 4; the need for food, water, and physiological requirements is met by PBF 1; cover and shelter requirements are met by PBF 2; areas for breeding, reproduction, and rearing of offspring are met by PBFs 1, 2, and 3; and habitats representative of the historical, geographical, and ecological distributions of a species are met by PBF 4.

Recovery

The primary goal identified in the recovery plan for the arroyo toad is to reclassify the species from endangered to threatened and, ultimately, to delist the species (Service 1999). Reclassification to threatened status may be considered when management plans have been approved and implemented on federally-managed lands to provide for conserving, maintaining, and restoring the riparian and upland habitats used by arroyo toads for breeding, foraging, and wintering habitat.

The recovery strategy for the arroyo toad includes the following actions: (1) stabilize and maintain populations throughout the range of the arroyo toad in California by protecting sufficient breeding and nonbreeding habitat; (2) monitor the status of existing populations to ensure recovery actions are successful; (3) identify and secure additional suitable arroyo toad habitat and populations; (4) conduct research to obtain data to guide management efforts and determine the best methods for reducing threats; and (5) develop and implement an outreach program (Service 1999).

In addition, at least 20 self-sustaining metapopulations or subpopulations of arroyo toads must be maintained. Self-sustaining populations or metapopulations are those documented as having successful recruitment (i.e., inclusion of newly matured individuals into the breeding adult cohort in 7 of 10 years of average to above average rainfall amounts with normal rainfall patterns). Self-sustaining populations or metapopulations require little or no direct human assistance such as captive breeding or rearing, or translocation of arroyo toads between sites. These populations must have adequate genetic and phenotypic variation, as described in the recovery plan.

California Red-legged Frog

Legal Status

The California red-legged frog was federally listed as threatened on May 23, 1996 (Service 1996). Revised critical habitat for the California red-legged frog was designated on March 17, 2010 (Service 2010a). The Service issued a recovery plan for the species on May 28, 2002 (Service 2002a).

Natural History

The California red-legged frog uses a variety of habitat types, including various aquatic systems, riparian, and upland habitats. They have been found at elevations ranging from sea level to approximately 5,000 feet. California red-legged frogs use the environment in a variety of ways, and in many cases, they may complete their entire life cycle in a particular area without using other components (i.e., a pond is suitable for each life stage and use of upland habitat or a riparian corridor is not necessary). Populations appear to persist where a mosaic of habitat elements exists, embedded within a matrix of dispersal habitat. Adults are often associated with dense, shrubby riparian or emergent vegetation and areas with deep (greater than 1.6 feet) still or slow-moving water; the largest summer densities of California red-legged frogs are associated with deep-water pools with dense stands of overhanging willows (*Salix* spp.) and an intermixed fringe of cattails (*Typha latifolia*; Hayes and Jennings 1988). Hayes and Tennant (1985) found juveniles to seek prey diurnally and nocturnally, whereas adults were largely nocturnal.

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

During periods of wet weather, starting with the first rains of fall, some individual California red-legged frogs may make long-distance overland excursions through upland habitats to reach breeding sites. In Santa Cruz County, Bulger et al. (2003) found marked California red-legged frogs moving up to 1.7 miles through upland habitats, via point-to-point, straight-line migrations without regard to topography, rather than following riparian corridors. Most of these overland movements occurred at night and took up to 2 months. Similarly, in San Luis Obispo County, Rathbun and Schneider (2001) documented the movement of a male California red-legged frog between two ponds that were 1.78 miles apart in less than 32 days; however, most California red-legged frogs in the Bulger et al. (2003) study were non-migrating frogs and always remained

within 426 feet of their aquatic site of residence (half of the frogs always stayed within 82 feet of water). Rathbun et al. (1993) radio-tracked three California red-legged frogs near the coast in San Luis Obispo County at various times between July and January; these frogs also stayed close to water and never strayed more than 85 feet into upland vegetation. Scott (2002) radio-tracked nine California red-legged frogs in East Las Virgenes Creek in Ventura County from January to June 2001, which remained relatively sedentary as well; the longest within-channel movement was 280 feet and the farthest movement away from the stream was 30 feet.

After breeding, California red-legged frogs often disperse from their breeding habitat to forage and seek suitable dry-season habitat. Cover within dry-season aquatic habitat could include boulders, downed trees, and logs; agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay-ricks, and industrial debris. California red-legged frogs use small mammal burrows and moist leaf litter (Rathbun et al. 1993; Jennings and Hayes 1994); incised stream channels with portions narrower and deeper than 18 inches may also provide habitat (Service 1996). This type of dispersal and habitat use, however, is not observed in all California red-legged frogs and is most likely dependent on the year-to-year variations in climate and habitat suitability and varying requisites per life stage.

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

Rangewide Status

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

Over-harvesting, habitat loss, non-native species introduction, and urban encroachment are the primary factors that have negatively affected the California red-legged frog throughout its range (Jennings and Hayes 1985; Hayes and Jennings 1988). Habitat loss and degradation, combined with over-exploitation and introduction of exotic predators, were important factors in the decline of the California red-legged frog in the early to mid-1900s. Continuing threats to the California red-legged frog include direct habitat loss due to stream alteration and loss of aquatic habitat, indirect effects of expanding urbanization, competition or predation from non-native species

including the bullfrog, catfish (*Ictalurus* spp.), bass (*Micropterus* spp.), mosquito fish (*Gambusia affinis*), red swamp crayfish (*Procambarus clarkii*), and signal crayfish (*Pacifastacus leniusculus*). Chytrid fungus is a waterborne fungus that can decimate amphibian populations, and is considered a threat to California red-legged frog populations.

A 5-year review of the status of the California red-legged frog was initiated in May 2011, but has not yet been completed.

Critical Habitat

The Service first designated critical habitat for the California red-legged frog on March 13, 2001 (Service 2001). We revised the designation in a final rule published on March 17, 2010 (Service 2010a). The final rule describes 48 separate units, encompassing approximately 1,636,609 acres, in 27 counties in California. The designation includes lands supporting those features necessary for the conservation of the California red-legged frog. In addition, the Service finalized a special rule pursuant to section 4(d) of the Act, associated with final listing of the California red-legged frog as threatened, for existing routine ranching activities (Service 2006a). A detailed discussion of the history and methods used in developing critical habitat can be found in the final rule (Service 2010a).

In accordance with section 3(5)(A)(i) of the Act and Federal regulations at 50 CFR 424.12, in determining which areas to designate as critical habitat, we identified the PBFs essential to the conservation of the species which may require special management considerations or protection. Because not all life history functions require all the PBFs, not all areas designated as critical habitat will contain all of the PBFs. Based on our current knowledge of the life history, biology, and ecology of the California red-legged frog, we determined the California red-legged frog's PBFs to consist of: (1) aquatic breeding habitat; (2) aquatic non-breeding habitat; (3) upland habitat, and (4) dispersal habitat. Detailed descriptions of these PBFs can be found in the final rule (Service 2010a). The following is a brief summary of the PBFs:

Aquatic breeding habitat consists of standing bodies of fresh water (with salinities less than 4.5 parts per thousand), including natural and manmade (stock) ponds, slow moving streams or pools within streams and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years.

Aquatic non-breeding habitat consists of the freshwater habitats as described for aquatic breeding habitat but which may or may not hold water long enough for the species to complete the aquatic portion of its lifecycle but which provide for shelter, foraging, predator avoidance, and aquatic dispersal habitat of juvenile and adult California red-legged frogs.

Upland habitat consists of upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of one mile in most cases (i.e., depending on surrounding landscape and dispersal barriers), including various vegetation types such as grassland, woodland, forest, wetland, or riparian areas that provide shelter, forage, and predator

avoidance for California red-legged frogs. Upland habitat should contain structural features such as boulders, rocks and organic debris (e.g., downed trees, logs), small mammal burrows, or moist leaf litter.

Dispersal habitat consists of accessible upland or riparian habitat within and between occupied or previously occupied sites that are located within 1 mile of each other, and that support movement between such sites. Dispersal habitat includes various natural habitats, and altered habitats such as agricultural fields that do not contain barriers (e.g., heavily traveled roads without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large lakes or reservoirs over 50 acres in size, or other areas that do not contain those features identified in PBFs 1, 2, or 3 as essential to the conservation of the species.

Recovery

The 2002 final recovery plan for the California red-legged frog (Service 2002a) states that the goal of recovery efforts is to reduce threats and improve the population status of the California red-legged frog sufficiently to warrant delisting. The recovery plan describes a strategy for delisting, which includes: (1) protecting known populations and reestablishing historical populations; (2) protecting suitable habitat, corridors, and core areas; (3) developing and implementing management plans for preserved habitat, occupied watersheds, and core areas; (4) developing land use guidelines; (5) gathering biological and ecological data necessary for conservation of the species; (6) monitoring existing populations and conducting surveys for new populations; and (7) establishing an outreach program. The California red-legged frog will be considered for delisting when:

Suitable habitats within all core areas are protected and/or managed for California red-legged frogs in perpetuity, and the ecological integrity of these areas is not threatened by adverse anthropogenic habitat modification (including indirect effects of upstream/downstream land uses).

Existing populations throughout the range are stable (i.e., reproductive rates allow for long-term viability without human intervention). Population status will be documented through establishment and implementation of a scientifically acceptable population monitoring program for at least a 15-year period, which is approximately 4 to 5 generations of the California red-legged frog. This 15-year period should coincide with an average precipitation cycle.

Populations are geographically distributed in a manner that allows for the continued existence of viable metapopulations despite fluctuations in the status of individual populations (i.e., when populations are stable or increasing at each core area).

The species is successfully reestablished in portions of its historical range such that at least one reestablished population is stable/increasing at each core area where California red-legged frog are currently absent.

The amount of additional habitat needed for population connectivity, recolonization, and dispersal has been determined, protected, and managed for California red-legged frogs.

The recovery plan identifies eight recovery units based on the assumption that various regional areas of the species' range are essential to its survival and recovery. The recovery status of the California red-legged frog is considered within the smaller scale of recovery units as opposed to the overall range. These recovery units correspond to major watershed boundaries as defined by U.S. Geological Survey hydrologic units and the limits of the range of the California red-legged frog. The goal of the recovery plan is to protect the long-term viability of all extant populations within each recovery unit.

Within each recovery unit, core areas have been delineated and represent contiguous areas of moderate to high California red-legged frog densities that are relatively free of exotic species such as bullfrogs. The goal of designating core areas is to protect metapopulations that combined with suitable dispersal habitat, will support long-term viability within existing populations. This management strategy allows for the recolonization of habitat within and adjacent to core areas that are naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of the California red-legged frog.

California Tiger Salamander - Central California DPS and Santa Barbara DPS

Legal Status

The Service recognizes three DPSs of the California tiger salamander: the Sonoma County DPS, the Santa Barbara County DPS, and the Central DPS. On September 21, 2000, the Service emergency listed the Santa Barbara County DPS of the California tiger salamander as endangered (Service 2000a). On March 19, 2003, the Service listed the Sonoma County distinct population segment of the California tiger salamander as endangered (Service 2003a). On August 4, 2004, the Service published a final rule listing the California tiger salamander as threatened range-wide, including the previously identified Sonoma and Santa Barbara distinct population segments (Service 2004a). This rule was subsequently vacated by a judicial decision on August 19, 2005, and the Sonoma and Santa Barbara County DPS was reinstated and returned to endangered status. The central California population is listed as threatened. The distribution of breeding locations of the three DPSs, don't naturally overlap (Loredo et al. 1996, Petranka 1998, Stebbins 2003).

In 2004, the Service designated critical habitat for the Santa Barbara County DPS of the California tiger salamander, consisting of six units totaling 7,491 acres (Service 2004b). In 2005, the Service designated critical habitat for the central DPS of the California tiger salamander, consisting of approximately 199,109 acres located within four geographic regions within California (Service 2005b).

Natural History

The California tiger salamander is a large and stocky terrestrial salamander with small eyes and a broad, rounded snout. Adults may reach a total length of 8.2 inches, with males generally averaging about 8 inches total length, and females averaging about 6.8 inches in total length. For both sexes, the average snout-to-vent length is approximately 3.6 inches (Service 2000a). The small eyes have black irises and protrude from the head. Coloration consists of white or pale yellow spots or bars on a black background on the back and sides. The belly varies from almost uniform white or pale yellow to a variegated pattern of white or pale yellow and black. Males can be distinguished from females, especially during the breeding season, by their swollen cloacae (a common chamber into which the intestinal, urinary, and reproductive canals discharge), larger tails, and larger overall size (Loredo and Van Vuren 1996).

Historically, California tiger salamanders inhabited low-elevation (generally under 1,500 feet) seasonal ponds and associated grassland, oak savannah, and coastal scrub plant communities of the Santa Maria, Los Alamos, and Santa Rita Valleys in the northwestern area of Santa Barbara County (Shaffer et al. 1993, Sweet 1993).Seasonal ponds, such as vernal pools (seasonal, shallow wetlands that alternate between dry and wet periods) and sag ponds (ponds located in depressions formed at a strike-slip fault), are typically used by California tiger salamanders for breeding. However, with the conversion and loss of many vernal pools through farmland conversion and urban and suburban development, ephemeral and permanent ponds that have been created for livestock watering are now frequently used by the species (Fisher and Shaffer 1996).

California tiger salamanders spend the majority of their lives in upland habitats and cannot persist without them (Trenham and Shaffer 2005). The upland component of California tiger salamander habitat typically consists of grassland savannah, but includes grasslands with scattered oak trees, and scrub or chaparral habitats (Shaffer et al. 1993, Service 2000a). Juvenile and adult California tiger salamanders spend the dry summer and fall months of the year in the burrows of small mammals, such as California ground squirrels (*Otospermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*; Storer 1925, Loredo and Van Vuren 1996, Trenham 1998). Burrow habitat created by ground squirrels and utilized by California tiger salamanders suggests a commensal relationship between the two species (Loredo et al. 1996). Movement of California tiger salamanders within and among burrow systems continues for at least several months after juveniles and adults leave the ponds (Trenham 2001). Active ground-burrowing rodent populations are likely required to sustain California tiger salamanders because inactive burrow systems become progressively unsuitable over time (Service 2004b). Loredo et al. (1996) found that California ground squirrel burrow systems collapsed within 18 months following abandonment by, or loss of, the mammals.

California tiger salamanders can undertake long-distance migrations, and can disperse long distances as well. They have been recorded traveling the second-longest distance among salamanders. California tiger salamanders move more readily among breeding ponds than other members of the family, a characteristic found consistently among different study sites (Trenham

et al. 2001, Wang et al. 2011). Many studies have recorded migration and dispersal distances by adult and juvenile California tiger salamanders, both through radio-tracking (Loredo et al. 1996, Trenham 2001) and upland drift fence capture (Trenham and Shaffer 2005, Orloff 2007, 2011). None of these studies were conducted within the range of the Santa Barbara County California tiger salamander, but are considered to be the best available scientific information on the species. Movement of California tiger salamanders is reviewed in Service (2009) and Searcy et al. (2013). In general, studies show that adults can move 1.2 miles to more than 1.4 miles from breeding ponds (Service 2000a, Trenham et al. 2001, Orloff 2011). Estimates differ on the proportion of a population likely to move large distances, with studies finding that 95 percent of a population occurs within 2,034 feet (Trenham and Shaffer 2005) and 1.1 miles (Search and Shaffer 2008, 2011, Searcy et al. 2013) of a breeding pond.

California tiger salamanders appear to have high site-fidelity, returning to their natal pond as adults and commonly returning to the same terrestrial habitat areas after breeding (Orloff 2007, 2011; Trenham 2001). Wang et al. (2009) studied genetic distinctness across 16 Central DPS California tiger salamander breeding sites (Fort Ord, Monterey County), and confirmed genetic differences at almost every site. Work is currently being conducted by the University of California, Los Angeles to determine the genetic distinctness across metapopulations in Santa Barbara County. Initial results show the northern two metapopulations (West Santa Maria and East Santa Maria) are more genetically similar than the four southern metapopulations (West Los Alamos, East Los Alamos, Purisima Hills, and Santa Rita Valley; Toffelmier and Shaffer 2017).

Winter rain events trigger California tiger salamanders to emerge from refugia and seek breeding ponds (Storer 1925). After mating, females attach their eggs to submerged twigs, grass stems, vegetation, or debris (Storer 1925; Twitty 1941). In ponds with little or no vegetation, females may attach eggs to objects, such as rocks and boards on the bottom (Jennings and Hayes 1994). In drought years, the seasonal pools may not form and the adults may not breed (Barry and Shaffer 1994). California tiger salamander eggs hatch into larvae within 10 to 28 days, (Petranka 1998; Hansen and Tremper 1993), with observed differences likely related to water temperatures. Generally, 10 weeks is required to allow sufficient time to metamorphose. The larval developmental period can be prolonged in colder weather, commonly in excess of 4 months (Trenham et al. 2000). After the larval developmental period, they emerge as terrestrial metamorphic salamanders, between approximately May and August (Trenham et al. 2000).

Metamorphosed juveniles leave the breeding sites in the late spring or early summer. Like the adults, juveniles may emerge from these retreats to feed during nights of high relative humidity (Storer 1925, Shaffer et al. 1993) before settling in their selected upland sites for the dry, hot summer months. While most California tiger salamanders rely on rodent burrows for shelter, some individuals may utilize soil crevices as temporary shelter during upland migrations (Loredo et al. 1996). Mortality of juveniles during their first summer exceeds 50 percent (Trenham 1998). Emergence from upland habitat in hot, dry weather occasionally results in mass mortality of juveniles (Holland et al. 1990). Juvenile dispersal is more common than adult dispersal (Trenham et al. 2001). Dispersing juveniles move from natal sites to future breeding sites that are not the pond of birth and not part of the local population.

Rangewide Status

Central California DPS
The range of the Central California tiger salamander has been classified into four recovery units (Service 2017). These recovery units are not regulatory in nature; the boundaries of the recovery units do not identify individual properties that require protection, but they are described solely to facilitate recovery and management decisions. The recovery units represent both the potential extent of Central California tiger salamander habitat within the species' range and the biologically (genetically) distinct areas where recovery actions should take place that will eliminate or ameliorate threats. All recovery units must be recovered to achieve recovery of the DPS.

The central California tiger salamander is endemic to the grassland community found in California's Central Valley, the surrounding foothills, and coastal valleys (Fisher and Shaffer 1996). We do not have data regarding the absolute number of California tiger salamanders due to the fact that they spend most of their lives underground. Virtually nothing is known concerning the historical abundance of the species. At one study site in Monterey County, Trenham *et al*. (2000) found the number of breeding adults visiting a pond varied from 57 to 244 individuals. A Contra Costa County breeding site approximately 124 miles north of the Trenham *et al*. (2000) study site in Monterey County showed a similar pattern of variation, suggesting that such fluctuations are typical (Loredo and Van Vuren 1996). At the local landscape level, nearby breeding ponds can vary by at least an order of magnitude in the number of individuals visiting a pond, and these differences appear to be stable across years (Trenham *et al*. 2001).

Santa Barbara DPS
The Santa Barbara County DPS of the California tiger salamander is restricted to northern Santa Barbara County in southern California. This population constitutes the southernmost range of the species (Service 2000a). At the time of publication of the emergency listing rule in January 2000, the Santa Barbara County California tiger salamander was known from 14 ponds. The emergency and final listing rules acknowledged that other potential breeding ponds or pond complexes may exist, but could not be surveyed at that time due to restricted access. The Santa Barbara County California tiger salamander is found in six metapopulation areas: (1) West Santa Maria/Orcutt, (2) East Santa Maria, (3) West Los Alamos, (4) East Los Alamos, (5) Purisima Hills, and (6) Santa Rita Valley (Service 2009). Each metapopulation areas encompasses both currently occupied, and potentially occupied suitable habitat for each metapopulation. Critical habitat for the Santa Barbara County California tiger salamander has been designated within portions of each of the six metapopulations (Service 2004b).

Currently, there are approximately 60 known extant California tiger salamander breeding ponds in Santa Barbara County (Service 2009) distributed across the six metapopulations. Since listing, Service and the CDFW developed guidance for protocol survey efforts (Service and CDFW 2003), and this guidance has aided in the detection of additional breeding ponds discovered post-listing. Several of the additional ponds were discovered as a result of surveys conducted as a part of proposed development or land conversion projects.

The California tiger salamander is threatened primarily by the destruction, degradation, and fragmentation of upland and aquatic habitats, primarily resulting from the conversion of these habitats by urban, commercial, and intensive agricultural activities (Service 2016a). Additional threats to the species include hybridization with introduced nonnative barred tiger salamanders (*A. tigrinum mavortium*; Service 2016a), destructive rodent-control techniques (e.g., deep-ripping of burrow areas, use of fumigants; Service 2016a), reduced survival due to the presence of mosquitofish (*Gambusia affinis*; Leyse and Lawlor 2000), and mortality on roads due to vehicles (Service 2000a). Disease, particularly chytridiomycosis and ranaviruses, and the spread of disease by nonnative amphibians, are discussed in the listing rule as an additional threat to the species (Service 2004a).

Lifetime reproductive success for California tiger salamanders is typically low. Less than 50 percent breed more than once (Trenham et al. 2000). In part, this is due to the extended length of time it takes for California tiger salamanders to reach sexual maturity; most do not breed until 4 or 5 years of age. Combined with low survivorship of metamorphs (e.g. in some populations, less than 5 percent of marked juveniles survive to become breeding adults; Trenham 1998), low reproductive success limits California tiger salamander populations. Because of this low recruitment, isolated subpopulations can decline greatly from unusual, randomly occurring natural events as well as from human-caused factors that reduce breeding success and individual survival. Based on metapopulation theory (Hanski and Gilpin 1991), factors that repeatedly lower breeding success in isolated ponds that are too far from other ponds for dispersing individuals to replenish the population further threaten the survival of a local population.

Critical Habitat

Central DPS

On August 23, 2005, the Service designated a total of 199,191 acres of critical habitat in 31 critical habitat units nested within four geographic regions for the Central population of California tiger salamander (Service 2005b). Per the final critical habitat designation, the physical or biological features within the defined area that are essential to the conservation of the species include:

1) Standing bodies of fresh water (including natural and manmade (*e.g.*, stock)) ponds, vernal pools, and other ephemeral or permanent water bodies which typically support inundation during winter rains and hold water for a minimum of 12 weeks in a year of average rainfall.

2) Upland habitats adjacent and accessible to and from breeding ponds that contain small mammal burrows or other underground habitat that CTS depend upon for food, shelter, and protection from the elements and predation; and

3) Accessible upland dispersal habitat between occupied locations that allow for movement between such sites.

Santa Barbara DPS
On November 24, 2004, the Service designated critical habitat for the Santa Barbara County population of California tiger salamander in six disparate areas of Santa Barbara County (Service 2004b). The locations of these areas are not directly analogous to the locations of the six metapopulations described above.

A total of 11,180 acres in six separate units are designated as critical habitat for the California tiger salamander in Santa Barbara County. Per the final critical habitat designation, the PBFs within the defined area that are essential to the conservation of the species include:

1) Standing bodies of fresh water, including natural and man-made (e.g., stock) ponds, vernal pools, and dune ponds, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a sufficient length of time (i.e., 12 weeks) necessary for the species to complete the aquatic portion of its life cycle;

2) Barrier-free uplands adjacent to breeding ponds that contain small mammal burrows. Small mammals are essential in creating the underground habitat that adult California tiger salamanders depend upon for food, shelter, and protection from the elements and predation; and

3) Upland areas between breeding locations (PBF 1) and areas with small mammal burrows (PBF 2) that allow for dispersal among such sites.

Recovery

Central DPS
The strategy of the Recovery Plan for the central DPS of the California Tiger Salamander (Service 2017) focuses on alleviating the threat of habitat loss and fragmentation in order to increase population resiliency (ensure each population is sufficiently large to withstand stochastic events), redundancy (ensure a sufficient number of populations to provide a margin of safety for the species to withstand catastrophic events), and representation (conserve the breadth of the genetic makeup of the species to conserve its adaptive capabilities). Recovery of this species can be achieved by addressing the conservation of remaining aquatic and upland habitat that provides essential connectivity, reduces fragmentation, and sufficiently buffers against encroaching development and intensive agricultural land uses. Appropriate management of these areas will also reduce mortality by addressing non-habitat related threats, including those from non-native and hybrid tiger salamanders, other non-native species, contaminants, disease, and road mortality. Research and monitoring should be undertaken to determine the extent of known threats, identify new threats, and reduce threats to the extent possible.

The recovery strategy is intended to establish healthy, self-sustaining populations of Central California tiger salamanders through the protection and management of upland and aquatic breeding habitat, as well as the restoration of aquatic breeding habitat where necessary. It also

ensures habitat management and monitoring and the conducting of research. Due to shifting conditions in the ecosystem (e.g., invasive species, unforeseen disease, climate change, and effects from future development and conversion to agriculture), the Service anticipates the need to adapt actions that implement this strategy over time. The recovery strategy ensures that the genetic diversity of the Central California tiger salamander is preserved throughout the DPS to allow adaptation to local environments, maintenance of evolutionary potential for adaptation to future stresses, and reduction in the potential for genetic drift and inbreeding to result in inbreeding depression.

The recovery plan (Service 2017) addresses specific delisting criteria for the DPS and lists the following objectives for recovery of the species:

1. Permanently protect the habitat of self-sustaining populations of Central California tiger salamander throughout the full range of the DPS, ensuring conservation of native genetic variability and diverse habitat types (e.g., high and low elevation sites and areas with higher and lower rainfall);
2. Ameliorate or eliminate the current threats to the species; and
3. Restore and conserve a healthy ecosystem supportive of Central California tiger salamander populations.

Santa Barbara DPS
The goal of the recovery plan for the Santa Barbara County DPS of California tiger salamander (Service 2016a) is to reduce the threats to the population to ensure its long-term viability in the wild, and allow for its removal from the list of threatened and endangered species. The interim goal is to recover the population to the point that it can be downlisted from endangered to threatened status.

Downlisting may be warranted when the recovery criteria below have been met in a sufficient number of metapopulation areas such that the Santa Barbara County DPS of the California tiger salamander exhibits increased resiliency and redundancy to prevent endangerment in the foreseeable future.

Delisting may be warranted when the following recovery criteria have been met in a sufficient number of metapopulation areas to support long-term viability of the Santa Barbara DPS of the California tiger salamander:

1. At least four functional breeding ponds are in fully preserved status per metapopulation area;
2. A minimum of 623 acres of functional upland habitat around each preserved pond is in fully preserved status;
3. Adjacent to the fully preserved ponds and fully preserved upland habitat, a minimum of 1,628 acres of additional contiguous, functional upland habitat is present, which is at least 50 percent unfragmented and partially preserved;
4. Effective population size in the metapopulation is, on average, increasing for 10 years;

5. Management is implemented to maintain the preserved ponds free of non-native predators and competitors (e.g., bullfrogs and fish);
6. Risk of introduction and spread of non-native genotypes is reduced to a level that does not inhibit normal recruitment and protects genetic diversity within and among metapopulations; and
7. The effects of vehicle-strike mortality have been minimized to a level that does not threaten viability and protects connectivity within metapopulations, including providing means for effective migration and dispersal in a roadway-impacted landscape.

The overall objectives of the recovery plan are to: (1) protect and manage sufficient habitat within the metapopulation areas to support long-term viability of the Santa Barbara County Distinct Population Segment of the California tiger salamander; and (2) reduce or remove other threats to the Santa Barbara County Distinct Population Segment of the California tiger salamander.

Conservancy Fairy Shrimp

Legal Status

The Conservancy fairy shrimp was listed as endangered in 1994 (Service 1994b) and critical habitat was designated in 2005 (Service 2005c). A five-year review was published in June 2012. The conservancy fairy shrimp remains listed as endangered.

Natural History

Conservancy fairy shrimp are tiny freshwater crustaceans with delicate elongate bodies, large stalked compound eyes, and 11 pairs of phyllopods (swimming legs that also function as gills). Conservancy fairy shrimp do not have a hard shell, a characteristic of the order *Anostraca* to which they belong. This species can be differentiated from other branchinectids by the flattened portions of its antennae. Conservancy fairy shrimp are endemic to vernal pools, and have adapted to this ephemeral environment. Conservancy fairy shrimp hatch out of tiny cysts within the soil during the first winter rains, and complete their entire life cycle by early summer. This species is restricted to the Central Valley of California, except for one population in the Central Coast in Ventura County. The majority of sites inhabited by this animal are relatively large and turbid vernal pools called playa pools (Helm 1998, Eriksen and Belk 1999, Vollmar 2002, Service 2005c). Playa pools typically remain inundated much longer than most vernal pools, often well into the summer, even though they normally have maximum depths comparable to vernal pools (Vollmar 2002). For more detailed information regarding this species' biology and life history, see the Recovery Plan (Service 2005d).

Rangewide Status

The California Natural Diversity Data Base (CNDDB) (2018) lists 43 occurrences for the Conservancy fairy shrimp. Conservancy fairy shrimp are rare, and at the time of listing, six

widely separated populations (i.e., clusters of localities) of this species were known (Service 1994b). The status of one of these six populations is unknown. This particular population was described as being located “south of Chico, Tehama County”. Tehama County is actually north of Chico, and the Service is not aware of its current status. Extensive surveys for fairy shrimp throughout the range of Conservancy fairy shrimp have located five additional populations since the species was listed in 1994. Currently, the Service is aware of 10 populations of Conservancy fairy shrimp, which include (from north to south): (1) Vina Plains, Butte and Tehama counties; (2) Sacramento National Wildlife Refuge (NWR), Glenn County; (3) Mariner Ranch, Placer County; (4) Yolo Bypass Wildlife Area, Yolo County; (5) Jepson Prairie, Solano County; (6) Mapes Ranch, Stanislaus County; (7) University of California (U.C.) Merced area, Merced County; (8) the Highway 165 area, Merced County; (9) Sandy Mush Road, Merced County; and (10) Los Padres National Forest, Ventura County (Service 2012) 5 year review.

Habitat loss and fragmentation is the greatest threat to the survival and recovery of vernal pool species. Habitat loss and fragmentation generally is a result of urbanization, agricultural conversion, and mining. Habitat loss occurs in the form of habitat alteration and degradation resulting from changes to natural hydrology; invasive species; incompatible grazing regimes, including insufficient grazing for prolonged periods; infrastructure projects such as roads, water storage and conveyance and utilities; recreational activities such as off-highway vehicles and hiking; erosion; and contamination. This habitat loss and fragmentation contributes to the isolation, fragmentation and functionality of vernal pool habitats. Direct loss of habitat generally represents irreversible damage to vernal pools; it disrupts the physical processes conducive to functional vernal pool ecosystems. The more severe the alteration and destruction, the more difficult it is to recover such areas in the future due to disruption of soil formations, hydrology, seed banks, and other components of a functional vernal pool ecosystem.

Even in areas where habitat is protected, the urbanization of surrounding lands can reduce the suitability of protected habitats, and hinders the dispersal of the Conservancy fairy shrimp within and between populations, as well as causing increased edge effects to pool complexes. Acquisition of land and conservation easements has resulted in the preservation of vernal pool habitat for the species, but the trend of vernal pool habitat loss in the state has continued. Remnant habitat that has been protected in small parcels is often subject to changed hydrological conditions, invasion by nonnative plants and other species, increased vegetation growth, and other conditions (such as inappropriate grazing levels) that serve to make habitat less suitable for the shrimp (Service 2012).

Climate change is expected to have an effect on vernal pool hydrology through changes in the amount and timing of precipitation inputs to vernal pools and the rate of loss through evaporation and evapotranspiration (Pyke 2004). These changes in hydrology will likely affect fairy shrimp species because they are obligate aquatic organisms with life histories dependent on certain hydrologic conditions (Pyke 2005). The suitability of vernal pools for fairy shrimp depends in large part on the timing and duration of wetland inundation, as these species are dependent on vernal pools that have sufficient water to remain wet throughout the annual reproductive phase of the species.

Critical Habitat

The PBFs of critical habitat for the vernal pool crustaceans (including vernal pool fairy shrimp) are the habitat components that provide:

1. topographic features characterized by mounds and swales and depressions within a matrix of surrounding uplands that result in complexes of continuously, or intermittently, flowing surface water in the swales connecting the pools, and providing for dispersal and promoting hydroperiods of adequate length in the pools;
2. depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water for a minimum of 18 days for vernal pool fairy shrimp and 19 days for Conservancy fairy shrimp in all but the driest years; thereby providing adequate water for incubation, maturation, and reproduction. As these features are inundated on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands;
3. sources of food, expected to be detritus occurring in the pools, contributed by overland flow from the pools' watershed, or the results of biological processes within the pools themselves, such as single-celled bacteria, algae, and dead organic matter, to provide for feeding; and
4. structure within the pools consisting of organic and inorganic materials, such as living and dead plants from plant species adapted to seasonally inundated environments, rocks, and other inorganic debris that may be washed, blown, or otherwise transported into the pools, that provide shelter.

161,786 acres within six critical habitat units for the Conservancy fairy shrimp are designated in Butte, Colusa, Mariposa, Merced, Solano, Stanislaus, Tehama, and Ventura Counties, California.

Recovery

The Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (Service 2005d) identifies eight core recovery areas found within five vernal pool regions for the Conservancy fairy shrimp: Vina Plains (Northeast Sacramento Region), Caswell and Grasslands Ecological Area (San Joaquin Region), Ventura County (Santa Barbara Region), Jepson Prairie, Sacramento National Wildlife Refuge and Collinsville (Solano-Colusa Region), and Madera (Southern Sierra Foothills Region).

General recovery criteria for Conservancy fairy shrimp and 19 other listed plants and animals are described in the Recovery Plan (Service 2005d). This Recovery Plan uses an ecosystem-level approach because many of the listed species and species of concern co-occur in the same natural ecosystem and share the same threats. The over-arching recovery strategy for Conservancy fairy shrimp is habitat protection and management. The five key elements that comprise this ecosystem-level recovery and conservation strategy are: (1) habitat protection; (2) adaptive

management, restoration, and monitoring; (3) status surveys; (4) research; and (5) participation and outreach.

The Recovery Plan identifies specific percentages of suitable habitat to be protected in each of the nine core areas. Core areas are ranked as zone 1, 2, or 3 in order of their overall priority for recovery. Core areas containing Conservancy fairy shrimp are included as both zones 1 and 2 in the Recovery Plan, with no core areas ranked as zone 3 (zone 3 represents currently unoccupied, historical habitat, which has not been identified for this species). To downlist the Conservancy fairy shrimp, the Recovery Plan recommends that 95 percent of the suitable species habitat in each of the zone 1 and zone 2 core areas (i.e., 95 percent of the suitable habitat in the Vina Plains core area, 95 percent of the suitable habitat in the Caswell area, etc.) be protected. This criterion has not been met. To delist the species, in addition to achieving the downlisting criteria, any newly discovered populations should be protected. This recovery criterion has been partially met, as the populations discovered since listing have been or will be protected. The Service does not yet have sufficient information to quantify either the acreage of suitable habitat within each core area or the acreage of protected habitat that is suitable for Conservancy fairy shrimp. The amount of suitable habitat that exists range wide has not yet been estimated; therefore, the percent that has been protected range wide is still unknown (Service 2012).

Vernal Pool Fairy Shrimp

Legal Status

The Service listed the vernal pool fairy shrimp as threatened on September 19, 1994 (Service 1994b) and designated critical habitat for the species on August 6, 2003 (Service 2003d). A recovery plan for vernal pool ecosystems of California and southern Oregon also addresses this species (Service 2005d); however, the populations in coastal San Luis Obispo County were not well known at the time the recovery plan was completed. The Service published the most recent 5-year review in 2007 (Service 2007c).

Natural History

This small crustacean ranges in size from 11 to 25 millimeters long and feeds on algae, bacteria, and protozoa. Like other fairy shrimp that live in vernal pools, this species survives the annual drying of vernal pools by reproducing with eggs (commonly called cysts) that can withstand heat, cold, and desiccation until the vernal pool refills once again. Vernal pool fairy shrimp require water temperatures of 50 degrees Fahrenheit or lower to hatch (Helm 1998; Eriksen and Belk 1999). The time to maturity and reproduction is temperature dependent, varying between 18 days and 147 days, with a mean of 39.7 days (Helm 1998). Immature and adult shrimp are known to die off when water temperatures rise to approximately 75 degrees Fahrenheit (Helm 1998). The vernal pool fairy shrimp is endemic to California where it exists only in ephemeral freshwater habitats, including alkaline pools, clay flats, vernal lakes, vernal pools, vernal swales, and other seasonal wetlands in California (Helm 1998). The vernal pool fairy shrimp sometimes,

but not often, co-occurs with other types of fairy shrimp, including the Conservancy fairy shrimp and Riverside fairy shrimp (Service 2005d)

The vernal pool fairy shrimp is a small freshwater crustacean in the family *Branchinectidae* of the order *Anostraca*. Adults range in size from 0.4 to 1.0 inches. Habitat for vernal pool fairy shrimp consists of vernal pools and other depressional features that pond for a period of time sufficient to complete their life cycle. Under optimal conditions this can be as little as 18 days; however, 41 days is more typical of usual seasonal conditions (Helm 1998, Eriksen and Belk 1999). The species often occurs in habitat that exhibits an unpredictable and short-lived inundation pattern and includes vernal pools and vernal pool-like depressions, depressions in sandstone rock outcrops, earth slumps, and grassy swales and depression basins. Upland vegetation communities associated with vernal pool fairy shrimp habitat include native and non-native grassland, alkaline grassland, alkaline scrub, and coastal sage scrub.

Vernal pool fairy shrimp are non-selective filter-feeders that filter suspended solids from the water column. They may filter and ingest detritus, bacteria, algal cells, and other items between 0.3 to 100 microns. This species rarely co-occurs with other fairy shrimp species but when they do, they are not usually the numerically dominant species (Eng et al. 1990, Eriksen and Belk 1999). All species of fairy shrimp provide a food source for a wide variety of wildlife, including beetles, insect larvae, frogs, salamanders, shorebirds, ducks, and even other fairy shrimp. Vernal pool fairy shrimp have a two-stage life cycle with the majority of their life cycle spent in a shelled embryo known as a cyst (or resting egg). It is unknown how many cysts a female can produce per clutch or over their lifetime. Cysts are either dropped to the pool bottom or remain in the brood sac until the female dies and sinks (Eriksen and Belk 1999). Fairy shrimp cysts are capable of withstanding heat, cold, and prolonged desiccation. While it is generally acknowledged that these cysts are able to live for a long time, there is very little information on just how long this might be (Belk 1998). We do know that they persist in the soil until conditions are favorable for successful hatching (Eng et al. 1990, Eriksen and Belk 1999). The cysts hatch when the vernal pools/seasonal depressional features fill with rainwater. Not all of the cysts in a feature hatch in a season, thus providing a mechanism for survival if the inundation period is too short in a given year. Vernal pool fairy shrimp may also undergo multiple hatches in a single feature during one wet season, if conditions are appropriate (Helm 1998, Gallagher 1996). Vernal pool fairy shrimp can mature quickly, allowing it to persist in short-lived shallow pools; however, the species also persists later into the spring when pool inundation persists. Resting eggs and adults disperse between suitable habitats passively by adhesion to waterfowl, migratory birds, cattle, and other wildlife and domestic animals (Eriksen and Belk 1999), as well as through the movement of water between suitable habitats or by resting egg adhesion to wind-blown dust.

Although vernal pool fairy shrimp are more widely distributed than most other fairy shrimp species, the species is generally uncommon throughout its range and rarely abundant where it is found (Eng et al. 1990, Eriksen and Belk 1999). The species currently occurs predominantly in a variety of vernal pool and ephemerally ponded habitats in the Central Valley and Coast Range of California, with a limited number of sites in the Transverse Range and on the Santa Rosa Plateau and in Hemet, Riverside County. There is also one disjunct occurrence in Jackson County,

southern Oregon. Elevations at which the species is typically found range from 33feet to 4,000 feet above mean sea level, although it has been found at 5,600 feet in the Los Padres National Forest (Service 2007c).

Rangewide Status

The CNDDB (2018) lists 766 occurrences for the vernal pool fairy shrimp. In California, the range of the species extends from disjunct locations in Riverside County and the Coast Ranges, north through Central Valley grasslands to Tehama County (Service 2007c). Within vernal pool and other ephemerally ponded habitats on the Central Coast of California (i.e., Monterey, San Luis Obispo, and Santa Barbara counties), vernal pool fairy shrimp are known to occupy at least 55 features on Fort Hunter Liggett, at least 46 features at Camp Roberts, in the vicinity of Soda Lake in the Carrizo Plain National Monument, several areas in the vicinity of Paso Robles, at least two sites in the Los Padres National Forest, in an estimated 60 features at the Chevron Tank Farm in San Luis Obispo, at least two vernal pools at the Santa Maria Airport, and in at least 12 complexes on Vandenberg Air Force Base (Service 2007c). A number of these sites were discovered after the publication of the final listing and critical habitat rules and 2005 recovery plan.

Maintaining the integrity of surrounding upland habitat is essential to the proper ecological function of vernal pool fairy shrimp habitat. Habitat loss and fragmentation represent the largest threats to the survival and recovery of vernal pool fairy shrimp and other species restricted to vernal pools and other ephemerally ponded habitats. Approximately 75 percent of historical vernal pool fairy shrimp habitat had been lost in the Central Valley by 1997 (Holland 1998), with additional habitat lost in the Central Coast mountain ranges (Holland 2003). Continuing annual habitat loss is estimated to be between 2 and 12 percent, depending on the region (Holland 2003). Habitat loss is generally a result of urbanization, agricultural conversion, and mining; although loss also occurs in the form of habitat alteration and degradation as a result of changes to natural hydrology, competition from invasive species, incompatible grazing regimes (including overgrazing), energy development, infrastructure projects (e.g., roads, water storage and conveyance, utilities), recreational activities (e.g., off-highway vehicles, hiking), erosion, mosquito abatement activities, climatic and environmental change, and contamination (Service 2007c).

The Service's 5-year review (Service 2007c) reported that delisting criteria 1 (reintroduction and protection of habitat) and 2 (habitat management and monitoring) have been partially met, including at least 13,000 acres of habitat protected; however, most recovery criteria have not been met. The Service does not have information indicating population or abundance trends for vernal pool fairy shrimp. Surveys for the species have increased the number of known occurrences including occurrences in San Luis Obispo and Santa Barbara Counties; however, concurrent habitat loss and fragmentation has occurred around some known populations. The 5-year review documents extensive habitat loss, including more than 50,000 acres impacted between 1994 and 2005 as a result of human population expansion and conversion of vernal pool habitat to agriculture. The 5-year review also discusses future habitat loss from anticipated

development around quickly growing urban areas. The indirect effects of development (e.g., pesticides, altered hydrology) on remaining habitat increasingly compound the effects of habitat loss on the species. The status review acknowledges that the threats to the species have not decreased since listing and recommends that the Service maintain the species' threatened status (Service 2007c).

Critical Habitat

The Service designated critical habitat collectively for four vernal pool crustaceans and 11 vernal pool plants in 34 counties in California and one county in southern Oregon on August 6, 2003 (Service 2003d) and a revised designation of critical habitat of approximately 858,846 acres was published on August 11, 2005 (Service 2005c). Both vernal pool fairy shrimp and Conservancy fairy shrimp are included in this designation (refer to the Conservancy shrimp Critical Habitat section above for PBFs).

On February 10, 2006, the Service published a final rule providing species-specific unit descriptions and maps identifying the critical habitat for each individual species. The rule identified 597,821 acres within 32 units for the vernal pool fairy shrimp.

Recovery

The Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon addressed 33 species, including the vernal pool fairy shrimp (Service 2005c). The goal of the recovery plan is to achieve and protect in perpetuity self-sustaining populations of vernal pool fairy shrimp throughout the species' range and delist the species. The decline of the vernal pool fairy shrimp is attributed primarily to habitat loss and fragmentation resulting from development and agricultural expansion, although invasive species and aquatic contaminants also have contributed to the species' decline. A primary component of the species' recovery is protecting vernal pool habitat in conservation areas and reserves.

The recovery plan specifies that the vernal pool fairy shrimp may be considered for delisting when:

1. at least 80 percent of occurrences and 85 percent of suitable habitat have been protected;
2. the species has been reintroduced to vernal pool regions and soil types where surveys indicate the species has been extirpated;
3. appropriate long-term management and monitoring is secured;
4. status surveys show that populations are stable or increasing and threats have been reduced or eliminated;
5. research has been conducted on genetic structure, population viability, and additional recovery actions; and
6. recovery teams and working groups are established to oversee recovery efforts and conduct outreach and incentive programs to develop partnerships.

Tidewater Goby

Legal Status

The Service listed the tidewater goby as endangered on March 7, 1994 (Service 1994d) and designated critical habitat for the tidewater goby on February 6, 2013 (Service 2013b). We published a recovery plan for the tidewater goby on December 12, 2005 (Service 2005f) and a 5-Year Review in September 2007 (Service 2007b). The Service published a proposed rule to downlist the tidewater goby on March 13, 2014 (Service 2014a). During the public comment period, the Service received substantial comments regarding the proposed change in species status, and the tidewater goby remains listed as endangered.

Natural History

The tidewater goby is endemic to California and is one of the only species of fish to live exclusively in brackish water coastal lagoons, estuaries, and marshes in California (Swift et al. 1989, Moyle 2002). Tidewater goby habitat is characterized by fairly still, but not stagnant, brackish water. They can withstand a wide range of habitat conditions and have been documented in waters with salinity levels that range from 0 to 42 parts per thousand, temperatures ranging from 46 to 77 degrees Fahrenheit and water depths from 10 to 79 inches (Irwin and Soltz 1984; Swift et al. 1989; Smith 1998). Most tidewater goby collections occurred in water of approximately one-third ocean salinity (i.e., 12 parts per thousand or less; Service 2005e). Tidewater gobies are generally found over substrate that has a high percentage of sand and gravel (Worcester 1992) and are often clumped in areas that have sparse to medium dense cover by aquatic plants or algae (Worcester 1992). Tidewater gobies often migrate upstream and are commonly found up to 0.6 mile up from a lagoon or estuary (Service 2005e), and have been recorded as far as 3 to 5 miles upstream of tidal areas (Irwin and Soltz 1985).

Tidewater gobies feed on small invertebrates, including amphipods, ostracods, snails, mysids, and aquatic insect larvae, particularly *chironomid* larvae (Swift et al. 1989). Predators of tidewater gobies include staghorn sculpin (*Leptocottus armatus*), prickly sculpin (*Cottus asper*), starry flounder (*Platichthys stellatus*), and largemouth bass (*Micropterus salmoides*); native birds and other predatory fish likely also prey on gobies (Swift et al. 1997, Swift et al. 1989).

The tidewater goby is primarily an annual species (Swift et al. 1989), although there is some variation in life history and some individuals have lived up to 3 years in captivity (Swenson 1999). If reproductive output during a single season fails, few (if any) tidewater gobies survive into the next year. Reproduction typically peaks from late April or May to July and can continue into November or December depending on the seasonal temperature and amount of rainfall (Swift et al. 1989, Worcester 1992, Goldberg 1977). Males begin the breeding ritual by digging burrows at least 3 to 4 inches apart in clean, coarse sand of open areas. Unlike most other fish, females court the males (Swift et al. 1989). Once chosen by a male, females will then deposit

eggs into the burrows, averaging 400 eggs per spawning effort (Swift et al. 1989, Swenson 1995). Males remain in the burrows to guard the eggs and fan the eggs to circulate water, frequently foregoing feeding (Moyle 2002).

Within 9 to 11 days after eggs are laid, larvae emerge and are approximately 4 to 6 millimeters in standard length (Swift et al. 1989, Service 2005e). Larval traits (larval duration, size at settlement, and growth rate) are correlated with water temperature, which varies considerably in the seasonally closed estuaries that tidewater gobies inhabit (Spies and Steele 2016). Larval tidewater gobies are pelagic for an average of 21 to 27 days and settle once they grow to approximately 12 to 13 millimeters in standard length (Spies et al. 2014). When they reach this life stage, they become substrate-oriented, spending the majority of time on the bottom rather than in the water column. Both males and females can breed more than once in a season, with a lifetime reproductive potential of 3 to 12 spawning events (Swenson 1999). Vegetation is critical for over-wintering tidewater gobies because it provides refuge from high water flows and tidewater goby densities are greatest among emergent and submerged vegetation (Moyle 2002).

Because they typically live for approximately one year and inhabit a seasonally changing environment, population sizes of tidewater gobies vary greatly spatially and seasonally, with recorded numbers ranging from 0 to 198 individuals per square meter (Swenson 1995). After the spring spawning season, there is typically an annual die-off of adults (Swift et al. 1989, Swenson 1995).

Rangewide Status

Historically, the tidewater goby occurred in at least 150 California coastal lagoons and estuaries, from Tillas Slough near the Oregon/California border south to Agua Hedionda Lagoon in northern San Diego County (Swift et al. 1989). The species is currently known to occur in 103 localities, although the number of sites fluctuates with climatic conditions and the current status is unknown in 12 localities. Currently, the most stable populations are in lagoons and estuaries of intermediate size (5 to 124 acres) that are relatively unaffected by human activities (Service 2005e).

Local populations of tidewater gobies are best characterized as metapopulations (Lafferty et al. 1999a), or “a network of semi-isolated populations with some level of regular or intermittent migration and gene flow among them, in which individual populations may go extinct but can then be recolonized from other populations” (Groom et al. 2006). Therefore, the stability of a metapopulation depends on the connectivity of subpopulations.

Tidewater gobies enter the marine environment when sandbars are breached during storm events. Lafferty et al. demonstrated that tidewater gobies were able to disperse at least 5.6 miles (Lafferty et al. 1999b), and genetic analysis suggests that this species can disperse much further, with genetic assignment tests showing movement of individuals up to approximately 30 miles (Jacobs et al. 2005). The species’ tolerance of high salinities for short periods of time enables it to withstand marine environment conditions of approximately 35 parts per thousand salinity,

thereby allowing the species to re-establish or colonize lagoons and estuaries following flood events (Swift et al. 1997). Genetic studies indicate that the tidewater goby population is highly geographically structured, indicating that there is low geneflow (Dawson et al. 2001, Dawson et al. 2002) and thus natural recolonization events are likely rare. Swift et al. (2016) estimates that the southernmost population of tidewater goby has been separated from other lineages for 2 to 4 million years, and it has been recognized as a distinct species (*Eucyclogobius kristinae*, the southern tidewater goby), but as of now the tidewater goby remains listed under Act as one entity.

Native predators are not known to be important regulators of tidewater goby population size in the lagoons of southern California. Rather, population declines are attributed to environmental conditions. The decline of the tidewater goby is attributed primarily to habitat loss or degradation resulting from urban, agricultural, and industrial development in and around coastal wetlands, lagoons, and estuaries (Irwin and Soltz 1985). High flows naturally and periodically breach lagoon barriers and expose tidewater gobies to tidal conditions, but artificial breaching has been observed to cause tidewater goby stranding and mortality (C. Dellith, U.S. Fish and Wildlife Service, pers. comm. 2018). Artificial breaching, especially during periods of low inflow, not only flushes tidewater gobies out into the ocean but also drains water from the lagoon and thus reduces the size of available habitat for this species; this can also concentrate predators within this reduced lagoon footprint. Some extirpations appear to be related to pollution, upstream water diversions, and the introduction of non-native predatory fish species, most notably centrarchid sunfish (*Lepomis* spp.) and bass (*Micropterus* spp.; Swift et al. 1989). These threats continue to affect some of the remaining populations of tidewater gobies. Climate change and the attendant sea level rise may further reduce suitable habitat for the tidewater goby as lagoons and estuaries are inundated with saltwater (Cayan et al. 2006) and severe storms interacting with increased sea levels may breach lagoons more frequently.

In 2014, the Service issued a 12-month finding proposing to reclassify the tidewater goby as threatened under the Act. During the public comment period, we received substantive comments regarding the proposed change in the species' status and new scientific information has been published regarding the species. The tidewater goby remains listed as endangered and its overall population and range is currently stable, but still faces ongoing and likely increasing threats of urbanization, artificial breaching, stochastic environmental conditions, and introduced predators. The southernmost population of tidewater goby remains critically endangered because this species has become extirpated from 5 of the 13 historical localities, 4 of which cannot be restored.

Critical Habitat

We originally designated critical habitat for the tidewater goby on November 20, 2000 (Service 2000c). In January 2008, we finalized a revised designation of critical habitat (Service 2008). On October 19, 2011, we published another proposed revision to critical habitat (Service 2011b), and on February 6, 2013, we published a final rule designating revised critical habitat for the tidewater goby (Service 2013b).

Under the Act and its implementing regulations, we are required to identify the PBFs essential to the conservation of the tidewater goby in areas occupied at the time of listing. We consider the PBFs that, when present in the appropriate quantity and spatial arrangement to provide for a species' life-history processes, are essential to the conservation of the species. The PBFs specific to the tidewater goby include:

1. Persistent, shallow (in the range of approximately 0.3 to 6.6 feet), still-to-slow-moving water in lagoons, estuaries, and coastal streams with salinity up to 12 parts per thousand, which provide adequate space for normal behavior and individual and population growth that contain one or more of the following:
    a. Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction;
    b. Submerged and emergent aquatic vegetation, such as *Potamogeton pectinatus*, *Ruppia maritima*, *Typha latifola*, and *Scirpus* spp., that provides protection from predators and high flow events; or
    c. Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity.

Critical habitat includes areas outside the geographical area occupied at the time of listing that contain suitable aquatic habitat in coastal lagoons or estuaries, provide connectivity between source populations or may provide connectivity in the future, or may be more isolated but represent unique adaptations to local features (habitat variability, hydrology, microclimate). In total, we designated 45 critical habitat units within the geographical area occupied at listing and 20 critical habitat units outside the geographical area occupied at listing that we have determined are essential for the conservation of the species.

Approximately 12,156 acres fall within the boundaries of the 65 critical habitat units designated by the 2013 final revised critical habitat rule. Revised critical habitat for the tidewater goby now occurs in Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego Counties, California.

Overall, the critical habitat for this species has remained stable but is still threatened by coastal development.

Recovery

The goal of the tidewater goby recovery plan (Service 2005e) is to conserve and recover the tidewater goby throughout its range by managing threats and maintaining viable metapopulations within each recovery unit while retaining morphological and genetic adaptations to regional and local environmental conditions. The decline of the tidewater goby is attributed primarily to habitat loss or degradation resulting from urban, agricultural, and industrial development in and around coastal wetlands. The recovery plan identifies six recovery units: North Coast Unit,

Greater Bay Unit, Central Coast Unit, Conception Unit, Los Angeles/Ventura Unit, and South Coast Unit.

The recovery plan specifies that the tidewater goby may be considered for downlisting when:

1. Specific threats to each metapopulation (e.g., coastal development, upstream diversion, channelization of rivers and streams, etc.) have been addressed through the development and implementation of individual management plans that cumulatively cover the full range of the species; and
2. A metapopulation viability analysis based on scientifically-credible monitoring over a 10-year period indicates that each recovery unit is viable. The target for downlisting is for individual sub-units within each recovery unit to have a 75 percent or better chance of persistence for a minimum of 100 years.

The tidewater goby may be considered for delisting when the downlisting criteria have been met and a metapopulation viability analysis projects that all recovery units are viable and have a 95 percent probability of persistence for 100 years.

Coastal California Gnatcatcher

Legal Status

The Service listed the coastal California gnatcatcher as threatened on March 30, 1993 (Service 1993) and published a final rule designating critical habitat for the coastal California gnatcatcher on October 24, 2000 (Service 2000b). As a result of various lawsuits and court decisions, the Service re-proposed critical habitat on April 24, 2003 (Service 2003b), and the final rule designating critical habitat was published on December 19, 2007 (Service 2007a).

In September 2010, the Service completed a 5-Year Review addressing the status of the coastal California gnatcatcher (Service 2010b). In the 5-Year Review, we found that implementation of large-scale, multi-species, regional Natural Community Conservation Plans/Habitat Conservation Plans (NCCPs/HCPs) has reduced the magnitude of threats associated with urban and agricultural development; however, the threat of habitat type-conversion is increasing due to multiple factors. Because of the increased magnitude of the threat of habitat type conversion, the 5-Year Review recommended no change to the listing status of the species.

On June 11, 2014, we received a petition requesting the coastal California gnatcatcher be delisted. After reviewing the available information, the Service determined the petitioned action was not warranted (Service 2016b) and the coastal California gnatcatcher remains listed as threatened.

Natural History

The coastal California gnatcatcher is endemic to cismontane southern California and northwestern Baja California, Mexico (Atwood 1991). It typically occurs in or near coastal sage scrub, comprising relatively low-growing, dry-season deciduous and succulent plants. Weaver Weaver (1998) defined characteristic plants of these communities to include California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), laurel sumac (*Malosma laurina*), lemonade berry (*Rhus integrifolia*), snapdragon penstemon (*Keckiella antirrhinoides*), sages (*Salvia* spp.), sunflowers (*Encelia* spp.), and cacti (*Opuntia* spp). The coastal California gnatcatcher may also use chaparral, grassland, and riparian plant communities where they occur adjacent to or intermixed with coastal sage scrub, especially during the non-breeding season (Campbell et al. 1998). Potential factors contributing to the coastal California gnatcatcher's use of alternative habitats may include more abundant food resources, higher survival rates during dispersal, fire avoidance, and cooler microclimate during heat stress (Campbell et al. 1998); however, coastal California gnatcatchers are closely tied to sage scrub habitats for reproduction (Atwood 1993).

The coastal California gnatcatcher is primarily insectivorous. Based on fecal sample analysis, its diet consists of small arthropods, especially leaf-hoppers (*Homoptera*) and spiders (*Araneae*), while true bugs (*Hemiptera*) and wasps, bees, and ants (*Hymenoptera*) are minor components (Burger et al. 1999).

Coastal California gnatcatchers are non-migratory and exhibit strong site tenacity (Atwood 1993). Breeding season territories range widely in size, from less than 2.5 acres to 37 acres (Atwood et al. 1998; Preston et al. 1998), with mean territory size generally greater for inland populations than coastal populations (Preston et al. 1998). During the non-breeding season, coastal California gnatcatchers have been observed to wander in adjacent territories and unoccupied habitat increasing their home range size to approximately 78 percent larger than their breeding territory (Preston et al. 1998).

The breeding season of the coastal California gnatcatcher extends from late-February through early August, with the peak of nesting attempts occurring from mid-March through mid-May. Most coastal California gnatcatchers breed their first year of age (Atwood and Bontrager 2001). Nests are constructed over a 4- to 10-day period and are most often placed in California sagebrush about 3 feet above the ground (Atwood 1993). Clutch size averages approximately 4 eggs (Atwood and Bontrager 2001). The egg incubation period is 14 days, and the nestling period is 10 to 15 days (Grishaver et al. 1998). Both sexes participate in all phases of the nesting cycle, and some pairs may produce more than one brood in one nesting season (Atwood and Bontrager 2001).

Juveniles stay within their natal territories 21 to 35 days after fledging from the nest (Grishaver et al. 1998), with juveniles subsequently dispersing to find their own foraging and nesting territories, if available. Juveniles usually disperse less than 6.2 miles from their natal territory (Atwood and Bontrager 2001), but they generally disperse less than 2 miles on average (Bailey

and Mock 1998; Galvin 1998; Atwood and Bontrager 2001). Dispersing coastal California gnatcatchers are apparently able to traverse human-modified landscapes for at least short distances (Bailey and Mock 1998). Juveniles begin to vie for territories as early as late spring, and will have established territories by the end of October (Preston *et al*. 1998).

Similar to other songbirds, mortality of coastal California gnatcatchers is highest for the youngest age class, with much of this attributable to predation of young in nests. Mean average survivorship of coastal California gnatcatchers during their first year is estimated to be 29 percent, with annual survivorship for adults 57 percent, although there is probably a high annual variation within and between populations. The oldest documented individual was a female at least 8 years old (Atwood and Bontrager 2001).

Rangewide Status

The range of the coastal California gnatcatcher extends from southern Ventura and San Bernardino counties, California, south to near El Rosario, Mexico, at about 30 degrees north latitude (Service 2010b). The northern and eastern limits of the coastal scrub vegetation communities used by the coastal California gnatcatcher are bound by mountainous areas, while the southern limit is defined by the transition to the Vizcaíno Desert. Most of the coastal California gnatcatchers in the United States are found in Orange, western Riverside, and San Diego counties. Relatively isolated populations also remain in portions of its former range in Los Angeles, San Bernardino, and southern Ventura counties (Atwood and Bontrager 2001). The current overall range is roughly the same as it was at the time of listing (Service 2010b). While the species' overall distribution has not changed much over time, the amount of suitable habitat within that range has declined which led to the species' listing as threatened in 1993 (Service 1993).

Coastal California gnatcatchers were considered locally common in the mid-1940s, but they had declined substantially in the United States by the 1960s (Atwood and Bontrager 2001). In 1993, the Service estimated that about 2,562 coastal California gnatcatcher pairs remained in the United States, with the highest densities occurring in Orange and San Diego counties (Service 1993). In a study using more rigorous sampling techniques, Winchell and Doherty (2008) found a mean of 1,324 pairs of coastal California gnatcatchers over four sampling periods in an 111,006-acre area on public and quasi-public lands in Orange and San Diego counties. Their sampling frame covered only a portion of the U.S. range, focusing on the coast, and was limited to 1 year. Although it is not valid to extrapolate beyond the sampling area, especially in light of known differences in population densities across the range of the coastal California gnatcatcher (Atwood 1992), we conclude it is likely there are more coastal California gnatcatchers in the U.S. portion of the range than was suggested by earlier estimates. For example, new locations are being recorded in Ventura and Los Angeles counties where the species was thought to be extirpated or only present in very low numbers. We are not aware of any recent estimates of coastal California gnatcatcher populations in Baja California.

The population estimates described above are based on surveys conducted prior to catastrophic fires in San Diego County in 2003 and San Diego and Orange counties in 2007. These fires may have temporarily reduced the overall coastal California gnatcatcher population because of the temporary loss of coastal California gnatcatcher occupied habitat. In the 2007 fires, about 28,173 acres of coastal sage scrub burned in Orange County and about 84,202 acres of coastal sage scrub burned in San Diego County in several separate locations.

The 5-Year Review for coastal California gnatcatcher includes a detailed evaluation of the current threats and conservation needs of the species. The species was listed in 1993 because of habitat loss and fragmentation resulting from urban and agricultural development (Service 1993). The direct loss of habitat reduces the amount of breeding, sheltering, and foraging area available, thereby proportionally reducing the population size and overall reproductive capacity of the species. Habitats that are fragmented have reduced biological integrity due to the increased potential for human-generated disturbance. Directly associated with development is an increase in recreational use of habitats, fire frequency, waste dumping, air pollution, exotic plant and animal species, predators, cowbird parasitism, domestic pets, and night lighting, all of which can have adverse impacts on the quality of habitat for the coastal California gnatcatcher.

Several stressors, including livestock grazing, anthropogenic atmospheric pollutants, and wildfire, promote habitat type conversion within the range of the coastal California gnatcatcher. Wildfire in particular is a major contributor because it promotes a feedback loop. That is, wildfire allows non-native grasses to outcompete re-growing native shrubs, which leads to an increase in non-native grasses, which makes the area more susceptible to wildfire, which allows the process to repeat, but with successively fewer native shrubs with each iteration. The number of wildfires has increased dramatically as urbanization (with its multitude of ignition sources) has come into greater contact with open space areas. Thus, the threat of habitat type conversion has increased throughout the range of the coastal California gnatcatcher since listing (Service 2010b).

Critical Habitat

The Service designated 11 critical habitat units for the coastal California gnatcatcher comprising 197,303 acres of Federal, State, local, and private land in Ventura, Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties (Service 2007a) critical habitat includes areas throughout the species' range in a variety of climatic zones and vegetation types that would preserve the genetic and behavioral diversity that currently exists within the species. The designation includes individual units that contain the physical and biological features essential to the species' conservation, and identifies special management considerations for the species.

The PBFs of designated critical habitat for the coastal California gnatcatcher are those habitat components that are essential to support the primary biological needs of foraging, nesting, rearing of young, intra-specific communication, roosting, dispersal, genetic exchange, or sheltering (Service 2007a). These include:

1. sage scrub habitats that provide space for individual and population growth, normal behavior, breeding, reproduction, nesting, dispersal, and foraging; and
2. non-sage scrub habitats such as chaparral, grassland, and riparian areas, in proximity to sage scrub habitats that provide space for dispersal, foraging, and nesting.

Recovery

The Service has not developed a recovery plan for the coastal California gnatcatcher. The 5-year review (Service 2010b) and the final rule on the petition to delist the species (Service 2016b) both contain information relative to this discussion, so we rely on those documents to assess the coastal California gnatcatcher's current recovery status and needs. The final rule on the delisting petition analyzes a 50-year timeframe with regard to the current threats to the coastal California gnatcatcher (Service 2016b).

Long-term management is required to address the numerous threats posed by the interface between the coastal California gnatcatcher's habitat and the urban interface. Some long-term management actions that will address identified threats include development and implementation of fire management plans, homeowner education programs (for residences adjacent to occupied habitat), predator control, cowbird trapping, routine invasive vegetation removal, limited public access in areas of high quality habitat, and control of irrigation water and other urban runoff adjacent to preserved habitat. Monitoring of the species distribution over time will assist in determining the effectiveness of management actions at reducing threats and will allow for changes in approach in the event that threats have not been adequately reduced.

Development continues throughout the range of the coastal California gnatcatcher. However, the implementation of regional NCCPs/HCPs in southern California has directed growth into certain areas, while establishing habitat preserves consisting of large "core" areas of coastal California gnatcatcher habitat and connecting "linkage" areas. Five regional plans are finalized and once fully implemented should preserve in perpetuity over 182,976 acres of coastal California gnatcatcher habitat (Service 2010b). Preserved habitat will be managed for the benefit of the coastal California gnatcatcher, thereby reducing the magnitude of the threat to the species due to habitat loss. Large Federal landholdings that support coastal California gnatcatcher habitat also contribute to core and linkage areas. These lands include Marine Corps Base Camp Pendleton, Marine Corps Air Station Miramar, Cleveland National Forest, and San Diego National Wildlife Refuge.

Another recovery concern is habitat type conversion. This occurs when native habitat is disturbed (e.g., fire, discing, etc.) that does not result in permanent ground disturbance but allows other plant communities (usually invasive, exotics plants) to convert the habitat into areas unsuitable for occupancy by coastal California gnatcatchers. Type conversion can affect all areas of habitat, even in those areas otherwise considered preserved. Because habitat type conversion is a threat of high magnitude, particularly given the increasing occurrence of wildfire, the 5-year review (Service 2010b) concluded that additional time is needed to evaluate the adequacy of existing management programs for reducing this threat.

Least Bell's Vireo

Legal Status

The least Bell's vireo was listed as endangered by the Service on May 2, 1986 (Service 1986a). The Service designated critical habitat on February 2, 1994, (Service 1994c) and completed a draft recovery plan in March 1998 (Service 1998).

We completed a 5-Year Review of the least Bell's vireo's status in September 2006 (Service 2006b). In the 5-Year Review, we recommended downlisting the least Bell's vireo from endangered status to threatened because of an increase in population size since its listing in 1986, expansion of locations with breeding least Bell's vireo throughout southern California, and conservation and management of suitable breeding habitat throughout its range. The Service has not published a rule downlisting the species, so the least Bell's vireo remains listed as endangered as of this writing.

Natural History

Least Bell's vireos are obligate riparian breeders, typically inhabiting structurally diverse woodlands along watercourses that feature dense cover within 3 to 6 feet of the ground and a dense, stratified canopy (Salata 1983; Gray and Greaves 1984; Service 1998). Important plant species in least Bell's vireo habitat include mature arroyo willows (*Salix.lasiolepis*) and black willows (*S. gooddingii*) and occasional cottonwoods (*Populus* spp.), western sycamore (P*opulus fremontii*), or coast live oak (*Quercus agrifolia*). The understory within this riparian habitat is typically dominated by mulefat (*Baccharis salicifolia*), California wild rose (*Rosa californica*), poison oak (*Toxicodendron diversiloba*), sandbar willow (*Salix hindsiana*), young individuals of other willow species, and several perennial species (Service 1998). Least Bell's vireos primarily forage and nest in riparian habitat, but they may also use adjoining upland scrub habitat (Salata 1983).

Vegetation structure more than the age of the vegetation appears to be the important determinant of vireo site use; however, early successional riparian vegetation typically supports the dense shrub cover required for nesting and also a structurally diverse canopy for foraging (Service 1998). Ecological processes that contribute to the formation of early successional riparian habitat include channel scour and deposition associated with periodic storm events. As riparian vegetation matures, the tall stands tend to shade out the shrub layer, making the sites less suitable for vireo nesting. In addition, vireo nests tend to occur in openings and along the riparian edge, where exposure to sunlight allows the development of shrubs (Service 1998).

Least Bell's vireos primarily feed on invertebrates, especially *lepidopteran* (butterfly and moth) larvae, within willow stands or associated riparian vegetation (Miner 1989). They occasionally forage in upland vegetation such as coastal sage scrub, chaparral, and oak woodlands, although foraging in these other habitats usually occurs within 100 feet of the edge of riparian vegetation (Salata 1983; Gray and Greaves 1984). The species' feeding largely consists of gleaning prey

from leaves or woody surfaces while perched or hovering and, less frequently, by capturing prey in aerial pursuit (Salata 1983; Miner 1989).

Least Bell's vireos generally arrive in southern California breeding areas by mid-March to early April, with males arriving before females and older birds arriving before first-year breeders (Service 1998). Individuals show site tenacity, typically returning to established breeding territories year after year (Greaves and Labinger 1997; Salata 1983). They generally remain on the breeding grounds until late September, although some post-breeding migration may begin as early as late July (Service 1998). Male least Bell's vireos establish and defend breeding territories through singing and physically chasing intruders (Barlow 1962; Service 1998). Their territories typically range in size from 0.5 to 4.5 acres, although a few as large as 7.5 acres have been recorded (Service 1998). Areas that contain relatively high proportions of degraded habitat are likely to have lower productivity (hatching success) than areas that contain high quality riparian woodland.

Least Bell's vireos begin building their nests a few days after pair formation, with the female selecting the nest site and both sexes constructing the nest (Barlow 1962; Service 1998). They typically suspend their nests in forked branches within 3 feet above the ground (Service 1998). Least Bell's vireos predominantly nest in willows (*Salix* spp.) and mulefat but will nest in a large variety of native and non-native plant species. Typically, three to four eggs are laid on successive days shortly after nest construction (Service 1998). The eggs are incubated by both parents for about 14 days with the young remaining in the nest for another 10 to 12 days (Nolan 1960; Barlow 1962). Each nest appears to be used only once with new nests constructed for each nesting attempt (Greaves 1987). Least Bell's vireos may attempt up to five nests within a breeding season, but they are typically limited to one or two successful nests within a given breeding season (Service 1998).

Multiple long-term monitoring studies indicate that approximately 59 percent of nests successfully produce fledglings, although on average only 1.8 chicks fledge per nest (Service 1998). Although least Bell's vireo nests appear to be more accessible to terrestrial predators because of their relatively low placement (Franzreb 1989), California scrub jays (*Aphelocoma californica*) account for the majority of documented depredation events (Peterson et al. 2004).

The activities of jays and other avian predators may have favored relatively low nest placement, as reflected in the least Bell's vireo's current nest site selection. Predation rates on least Bell's vireo nests can exceed 60 percent of the nests in a given area within a year (Kus 1999), but typical nest predation rates average around 30 percent (Franzreb 1989).

Some individual least Bell's vireos have been documented to live up to 7 years (Service 1998), but the average lifespan for this species is likely substantially lower. Greaves and Labinger (1997) and the Service (1998a) have estimated first-year survivorship to average approximately 25 percent. The annual survivorship of least Bell's vireos in subsequent years is estimated to be about 47 percent, and is slightly lower for females than males presumably due to the higher energetic costs of egg production (Service 1998).

Banding records indicate that while most first-year breeding least Bell's vireos return to their natal drainage after winter migration, some disperse considerable distances to other breeding locations (Greaves and Labinger 1997; Service 1998). For example, several least Bell's vireos banded as nestlings in San Diego County have been re-sighted as breeding adults in Ventura County, and the opposite movement from Ventura to San Diego has also been observed (Greaves and Labinger 1997).

Rangewide Status

The least Bell's vireo historically occupied willow riparian habitats from Tehama County in northern California, southward to northwestern Baja California, Mexico, and as far east as Owens Valley, Death Valley, and the Mojave River (Grinnell and Miller 1944; Service 1998). Although originally considered to be abundant locally, regional declines of this subspecies were noticeable by the 1940s (Grinnell and Miller 1944), and the least Bell's vireo was believed to have been extirpated from California's Central Valley by the early 1980s (Franzreb 1989). At the time of the listing in 1986, more than 99 percent of the remaining least Bell's vireos were concentrated in southern California (Santa Barbara County and southward), with San Diego County containing 77 percent of the population (Service 1986a).

The least Bell's vireo population in the United States increased 10-fold, from 291 to 2,968 known territories, between 1986 and 2005 (Service 2006b). Population growth was the greatest in San Diego and Riverside counties, with lesser but significant increases in Orange, Ventura, San Bernardino, and Los Angeles counties. The largest concentrations of vireos were located in San Diego County along the Santa Margarita River on Marine Corps Base Camp Pendleton and in Riverside County at the Prado flood control basin on the Santa Ana River (Service 2006b). Based on a composite of survey information collected between 2001 and 2005, 54 percent of the population was estimated to occur in San Diego County, 30 percent occurred in Riverside County, and the remaining vireo territories were scattered throughout Orange (6 percent), San Bernardino (3 percent), Ventura (4 percent), and Los Angeles counties (2 percent; Service 2006b). Less than one percent of the documented vireo territories occurred in Santa Barbara, Inyo, and Stanislaus counties (Service 2006b). Thus, despite a significant increase in overall population numbers and a slight shift northward in the species' distribution, the vireo continues to primarily be restricted to the southern portion of its historic range.

More recently, USGS presented population trends for least Bell's vireo between 2003 and 2014 (Kus et al. 2015). The trend data is difficult to interpret with certainty due to differences in survey effort and survey sites each year. In addition, the data likely underestimates the total population because many smaller sites lack consistent survey efforts. Nevertheless, the vireo population appears to have increased steadily up until 2010 and has declined slightly since that time (i.e., 3,280 territorial males were reported in 2010 and 2,477 territorial males were reported in 2014). The population remains above what was reported by USGS between 2003 and 2007.

The 1986 listing rule identified brood parasitism by brown-headed cowbirds (*Molothrus ater*) as a substantial threat to the least Bell's vireo, and it remains the primary threat to least Bell's vireo recovery (Service 2006b). Cowbird trapping has proven to be an effective management technique for recovering vireo populations in areas where it is implemented; however, Kus and Whitfield (2005) argue that trapping programs may not be the best way to achieve long-term recovery of the vireo since it relies on continued human intervention. Nevertheless an effective alternative to cowbird trapping has not yet been identified. Therefore, additional research is needed to identify the best way to manage this threat over the long term (Service 2006b).

At the time of the listing, loss of habitat due to agricultural practices, urbanization, and exotic plant invasion was identified as a major threat to least Bell's vireo populations. The destruction and modification of riparian habitat within the species' current range has been curtailed significantly since the least Bell's vireo was listed, primarily due to protections provided by its listing in 1986 along with other Federal and State regulations that protect wetlands. Agriculture and grazing continue to threaten riparian habitat within the larger historical range of the least Bell's vireo, particularly the Salinas, San Joaquin, and Sacramento valleys (Service 1998); however, urbanization has displaced former agriculture and grazing operations in many areas within southern California. Occupied least Bell's vireo habitat that is adjacent to highly urbanized areas or within major river systems continues to be impacted by flood control and water impoundment projects and may be subject to ongoing and future habitat loss or degradation (Service 2006b).

Giant reed (*Arundo donax*) is a persistent threat throughout much of the vireo's range as it displaces native vegetation, reducing the quality of riparian habitat for the vireo (Service 1998). Within the past decade, control of giant reed and other exotic plants is being conducted systematically in watersheds throughout the vireo's range (Service 2006b). In general, giant reed removal has been effective at restoring least Bell's vireo habitat, but will require continued annual efforts to achieve local eradications and address new invasions. Although control of giant reed has made great progress since the original listing of the least Bell's vireo, invasions by other exotic plants [e.g., Tamarix species, perennial pepperweed (*Lepidium latifolium*)] continue to threaten existing riparian habitat.

Within the past few years, a new threat has emerged that has the potential to significantly impact vireo nesting throughout its range. A disease complex involving two species of ambrosia beetles, the polyphagous shot hole borer (*Euwallacea* sp. 1) and Kurushio shot hole borer (*Euwallacea* sp. 5), a mix of associated fungi (Lynch et al. 2016), and other pathogens is causing widespread damage to trees in riparian ecosystems throughout southern California (Eskalen et al. 2013). These shot hole borers create galleries in trees and inoculate the galleries with fungal spores. *Fusarium* sp. causes significant damage to trees, and the galleries open up trees to attack from other pathogens that may be even more damaging.

The combination of structural damage from the galleries and tissue damage from the pathogens causes limbs to break and trees to die. For example, occupied habitat in the Tijuana River (Recovery Unit 1) has already been infested, and an estimated 140,000 trees or 35 percent of the

trees showed extensive damage from the disease complex (Boland 2016). Willow species are particularly susceptible to damage from the infestation. Preliminary reports suggest that the Prado Basin (Recovery Unit 7) and the San Luis Rey River (Recovery Unit 5) also have substantial infestations. The Sweetwater River (Recovery Unit 3) and San Diego Creek (Recovery Unit 8) are also known to be infested.

No systematic, regional surveys for shot hole borers have been conducted, and it is likely that additional vireo habitat is infested. Because vireos require structure associated with willows and similar species, we anticipate that vireo breeding success will decline in infested habitats. It is too early to determine how this significant new threat will affect the overall status of the species, but it is being monitored closely by the Service. Significant mortality of mature trees related to this threat may alter vireo prey availability, increase exposure to predation (especially for vireo nests), and affect hydrogeomorphic processes (e.g., flooding, alluvial deposition) important for maintaining healthy riparian woodlands that vireos use for feeding, sheltering, and breeding.

Several large, regional habitat conservation plans in southern California have addressed the effects of urban development on the least Bell's vireo. These plans are expected to provide long-term protection of core occurrences of least Bell’s vireos in western Riverside, Orange, and San Diego counties. In addition, compliance-driven and voluntary riparian restoration activities throughout the species’ historical range may have contributed to an increase in riparian habitat since the listing of the least Bell’s vireo (Service 2006b).

Critical Habitat

The Service designated critical habitat for the least Bell's vireo on February 2, 1994 (Service 1994c). In determining the areas we designated, we considered the PBFs essential to the conservation of the species and that require special management consideration (as defined at 50 CFR 424.12). The final rule describes these PBFs as riparian woodland vegetation that generally contains both canopy and shrub layers, and includes some associated upland habitats (Service 1994c).

The final rule also identifies actions that may affect critical habitat (Service 1994c). These activities include:

1. removal or destruction of riparian vegetation;
2. thinning of riparian growth, particularly near ground level;
3. removal or destruction of adjacent chaparral or other upland habitats used for foraging; and,
4. increases in human-associated or human-induced disturbance.

While these are examples of activities that may affect critical habitat for the least Bell's vireo, other activities may be proposed that also affect the PBFs.

We designated critical habitat in 10 locations in southern California totaling 38,000 acres (Table 2). Within those 38,000 acres, approximately 10,979 acres are federal land (U.S. Forest Service, U.S. Army Corps of Engineers, and International Boundary and Water Commission). The reminder of the acreage is under control of state, county, city, Tribal, or private entities. At the time of the final rule for the critical habitat, the 38,000 acres represented approximately 49 percent of least Bell's vireo population in the United States (Service 1994c).

Table 2: Least Bell's Vireo Critical Habitat Locations

Index Map Location*	Drainage	County
A	Santa Ynez River	Santa Barbara
B	Santa Clara River	Los Angeles/Ventura
C	Santa Ana River	Riverside/San Diego
D	Coyote Creek	San Diego
E	Santa Margarita River	San Diego
F	San Luis Rey River	San Diego
G	San Diego River	San Diego
H	Sweetwater River	San Diego
I	Jamul-Dulzura Creeks	San Diego
J	Tijuana River	San Diego

* Index Map Locations from final rule (Service 1994c)

Recovery

The Service published a draft recovery plan for the least Bell's vireo in 1998 (Service 1998), but the plan was never finalized. Subsequently, we prepared a 5-year status review for the species (Service 2006b) that examined the recovery criteria in that draft plan and concluded, “Due to new information regarding the species and an improved understanding of ongoing recovery actions to reduce threats, the recovery goals and strategies should be modified and refined.” The 5-year status review (Service 2006b) provided a set of recommendations for a future recovery plan that included:

1. complete a functional recovery plan for the vireo with realistic, objectively based recovery goals;
2. provide funding and technical support for further studies investigating continuing threats to the vireo from cowbird parasitism, exotic plant invasion of riparian habitats, and potentially elevated predation pressures due to habitat fragmentation or presence of exotic predators (i.e., domestic cats and Argentine ants);
3. Complete an assessment or support other efforts (such as the RHJV effort) to assess the amount and distribution of riparian habitat in California including:
    a. establishment of baseline values for comparison to past and future estimates, including an assessment of various riparian habitat subtypes;
    b. An evaluation of changes in distribution and connectivity of riparian habitat at different stream-order levels (i.e., primary, secondary, tertiary, etc.); and

   c. an evaluation of the amount of riparian habitat restoration attempted and successfully completed since the listing, including restoration not driven by regulatory compliance; and
4. Develop and implement:
   a. a systematic survey program to locate vireo re-colonization of the Salinas, San Joaquin, and Sacramento Valleys so that appropriate management can be developed and implemented; and,
   b. systematic survey programs for watersheds in southern California that are no longer regularly surveyed within a given 5-year period (e.g., Dulzura Creek/Jamul Creek/Otay River, San Diego River, San Dieguito River/Santa Ysabel Creek, San Gabriel River, etc.). It is possible that these systematic surveys may need to rely on volunteer efforts organized and supported by the Service.

Until a final recovery plan for the least Bell's vireo is developed, we rely on the most up-to-date information for discussing recovery in our biological opinions. The ideas provided in the 5-year status review and cited above are currently the best information we have on which to base our analysis.

Southwestern Willow Flycatcher

Legal Status

The southwestern willow flycatcher was federally listed as endangered on February 27, 1995 (Service 1995) and critical habitat was designated for the subspecies on October 19, 2005 (Service 2005e). Revised critical habitat was designated January 3, 2013 (Service 2013a). The final recovery plan for the subspecies was completed in August 2002 (Service 2002b).

Natural History

The southwestern willow flycatcher breeds in southern California (north to the Santa Ynez River, Kern River, and Independence on the Owens River), southern Nevada, southern Utah, Arizona, New Mexico, and extreme western Texas. All subspecies of the willow flycatcher are completely migratory. The species as a whole winters from southern Mexico south through Central America to Panama and western Venezuela. Subspecies *extimus* has been collected in winter in Mexico, Guatemala, El Salvador, Nicaragua, and Costa Rica (Unitt 1987, Paxton et al. 2011).

The southwestern willow flycatcher breeds only in riparian woodland, typically adjacent to or over water. Surface water or saturated soil is usually present in or adjacent to nesting sites during at least the initial portion of the nesting period (Tibbitts et al. 1994). Riparian woodland used by willow flycatchers typically has a canopy and an understory of shrubs or saplings. Native willows dominate the habitat commonly represented in current and historical records.

Southwestern willow flycatchers do nest in some riparian habitats containing and even dominated by tamarisk (McKernan and Braden 1999, Paradzick et al. 2000). In terms of

southwestern willow flycatcher productivity, the suitability of tamarisk dominated habitats is not known. Southwestern willow flycatcher productivity in some sites dominated by non-native vegetation is lower than in some native-dominated habitats (Sogge et al. 1997). The reverse is also true, however; within some tamarisk-dominated habitats southwestern willow flycatcher productivity is similar or higher than nearby native-dominated sites (McKernan and Braden 1999, Paradzick et al. 2000).

The southwestern willow flycatcher is a diurnal insectivore, catching its prey on the wing usually in the middle story of riparian woodland. Males maintain and advertise a territory by singing to attract females. There is little information on the factors a southwestern willow flycatcher female uses to select a mate, though it may be related to some factor of habitat quality or potential quality of the male (Service 2002b). Territorial defense begins immediately after spring arrival. Females occasionally sing, apparently when stimulated by territorial disputes (Sogge et al. 1997). Male southwestern willow flycatchers sing most persistently early in the breeding season, but song rate declines as the season progresses, particularly once the male finds a mate and nesting efforts begin (Finch et al. 2000). Their response to taped playback of songs during surveys has also been known to decrease as the nesting season progresses. Mapped breeding territory sizes are 0.15 to 0.5 acre on the Colorado River (Sogge et al. 1997), 0.5 to 1.25 acres along the Verde River, Arizona (Sogge 1995), and 0.35 to 5.7 acres along the Kern River, California (Whitfield and Enos 1996).

Nests are initiated usually within one week of pair formation, 10 to 14 days after spring arrival. Building nests takes 3 to 8 days. In historical egg collections from southern California, 86 percent of nests were in *Salix* spp. (willow), 4 percent in *Urtica dioica* (stinging nettles), and 10 percent in other plants (Unitt 1987). Females typically lay one egg per day, until the nest contains three to four eggs. Incubation begins after the last egg is laid, and lasts 12 to 13 days (Service 2002b). During incubation, females spend approximately 50 percent of the day attending (incubating or shading) the eggs and incubate throughout the night. Incubation and shading bouts can last from less than 1 to more than 60 minutes (Finch et al. 2000).

Southwestern willow flycatcher young usually leave the nest 12 to 15 days after hatching. During the brooding period, the young are cared for by both the male and female. Feeding trips during the peak of this period can reach 30 trips per hour during days 5 to 10 (Finch et al. 2000). Fledglings stay close to the nest and each other for 3 to 5 days, and may repeatedly return to and leave the nest during this period (Spencer et al. 1996).

Southwestern willow flycatchers typically arrive on breeding grounds from late April to early June (Service 2002b). Evidence gathered during multi-year studies of color-banded populations show that although most southwestern willow flycatchers return to former breeding areas, they regularly move among sites within and between years (Netter et al. 1998). From 1997 to 2000, 66 to 78 percent of southwestern willow flycatchers returned to the same breeding site (Luff et al. 2000). Movements within drainages are more common than between drainages.

Rangewide Status

Unitt (1987) concluded that the southwestern willow flycatcher was once fairly common in the Los Angeles Basin, where habitat is virtually absent now. Approximately 616 acres of riparian habitat has regenerated along the South Fork Kern River since the early 1980s, but fluctuations in number of territories in this area has made it difficult to determine a trend in the population for this area (Whitfield et al. 1999). Downstream from the South Fork Kern River, willow flycatchers (unknown subspecies) were common breeders in the early 1900s, but today virtually no riparian habitat remains. Outside of the Kern River, southwestern willow flycatcher populations are present along the Owens, San Luis Rey, and Santa Margarita (Camp Pendleton) Rivers. Changes in land use along the San Luis Rey River have improved habitat quality and extent, which has resulted in an increase in the number of territorial southwestern willow flycatcher males from 12 in the late 1980s (Unitt 1987) to more than 40 in 1999 (Kus et al. 1999). In contrast, the populations on Camp Pendleton have remained fairly constant for the past two decades despite apparently suitable habitat to support population expansion. The remaining southwestern willow flycatcher populations in southern California, most of which number fewer than five territories, occur at scattered sites along drainages that have changed little in the past 15 years.

The decline of the southwestern willow flycatcher is attributed to numerous factors, including nest depredation and brood parasitism by the brown-headed cowbird. However, large scale loss of southwestern wetlands, particularly cottonwood-willow riparian habitat, is the principal reason for the southwestern willow flycatcher's current status. Habitat loss is a result of urban and agricultural development, water diversion and impoundment, livestock grazing, and hydrological changes attributable to these and other land uses (Service 1995). In some cases, willow flycatchers are faced with situations that force movement, such as when catastrophic habitat loss occurs from fire or flood. Several such cases have been documented, with some of the resident willow flycatchers moving to remaining habitat within the breeding site, some moving to other sites 1.2 to 16.8 miles away (Paxton et al. 1997, Owen and Sogge 1997), and others disappearing without being seen again.

Critical Habitat

Revised critical habitat for the southwestern willow flycatcher was designated on January 3, 2013 (Service 2013a). Designated southwestern willow flycatcher habitat provides aquatic and terrestrial habitat containing the essential PBFs to support and maintain self-sustaining populations and metapopulations throughout its range. The southwestern willow flycatcher breeds in riparian habitats along rivers, streams, or other wetlands, where relatively dense growths of trees and shrubs are established, near or adjacent to surface water or underlain by saturated soil. Habitat characteristics such as dominant plant species, size and shape of habitat patch, canopy structure, vegetation height, and vegetation density vary widely among sites. As a neotropical migrant (migrating between Central and South America and the United States), migration stopover areas for the southwestern willow flycatcher, even though not used for breeding, are critically important, (i.e. essential) resources affecting productivity and survival.

Based on our current knowledge of the life history, biology, and ecology of the subspecies and the requirements of the habitat to sustain the essential life history functions, we determined that the southwestern willow flycatcher's PBFs are:

1. Riparian habitat in a dynamic river or lakeside, natural or manmade successional environment (for nesting, foraging, migration, dispersal, and shelter) that comprises trees and shrubs (that can include Gooddings willow, coyote willow, Geyers willow, arroyo willow, red willow, yewleaf willow, pacific willow, box elder, tamarisk, Russian olive, buttonbush, cottonwood, stinging nettle, alder, velvet ash, poison hemlock, blackberry, seep willow, oak, rose, sycamore, false indigo, Pacific poison ivy, grape, Virginia creeper, Siberian elm, and walnut) and some combination of:
    a. Dense riparian vegetation with thickets of trees and shrubs that can range in height from about 6 to 98 feet. Lower-stature thickets (6 to 13 feet tall) are found at higher-elevation riparian forests and tall-stature thickets are found at middle- and lower-elevation riparian forests; and/or
    b. Areas of dense riparian foliage at least from the ground level up to approximately 13 feet above ground or dense foliage only at the shrub level, or as a low, dense tree canopy; and/or
    c. sites for nesting that contain a dense (about 50 to 100 percent) tree or shrub (or both) canopy (the amount of cover provided by tree and shrub branches measured from the ground); and/or
    d. dense patches of riparian forests that are interspersed with small opening of open water or marsh or areas with shorter and sparser vegetation that creates a variety of habitat that is not uniformly dense. Patch size may be as small as 0.25 acre or as large as 175 acres; and
2. A variety of insect prey populations found within or adjacent to riparian floodplains or moist environments, including: flying ants, wasps, and bees (*Hymenoptera*); dragonflies (*Odonata*); flies (*Diptera*); true bugs (*Hemiptera*); beetles (*Coleoptera*); butterflies/moths and caterpillars (*Lepidoptera*); and spittlebugs (*Homoptera*).

Critical habitat for the southwestern willow flycatcher is designated across a wide portion of the subspecies' range and is organized in Management Units (as described in the Recovery Plan; Service 2002b). We designated stream segments in 15 management units found in 5 recovery units as critical habitat for the southwestern willow flycatcher. Critical habitat is located in Apache, Cochise, Gila, Graham, Greenlee, Maricopa, Mohave, Pinal, Pima, Santa Cruz, Yavapai, and Yuma counties in Arizona; Imperial, Los Angeles, Kern, Mono, Orange, Riverside, Santa Barbara, San Bernardino, San Diego, and Ventura counties in southern California; Clark, Lincoln, and Nye counties southeastern Nevada; Catron, Cibola, Dona Ana, Grant, Hidalgo, McKinley, Mora, Rio Arriba, Santa Fe, San Juan, Soccoro, Taos, and Valencia counties in New Mexico; Alamosa, Conejos, Costilla, la Plata, and Rio Grande counties in southern Colorado and; Kane, Juan, and Washington counties in Southwestern Utah.

The physical and biological features essential to the conservation of the southwestern willow flycatcher described above are results of the dynamic river environment that germinates,

develops, maintains, and regenerates the riparian forest and provides food for breeding, nonbreeding, dispersing, territorial, and migrating southwestern willow flycatchers. Anthropogenic factors such as dams, irrigation ditches, or agricultural field return flow can assist in providing conditions that support flycatcher habitat. It is important to recognize that the PBFs are present throughout the river segments selected (PBF 1), but the specific quality of riparian habitat for nesting (PBF 1), migration (PBF 1), foraging (PBF 1 and 2), and shelter (PBF 1) will not remain constant in their condition or location over time due to succession (*i.e.*, plant germination and growth) and the dynamic environment in which they exist.

The Service designated stream ‘‘segments’’ as critical habitat for the southwestern willow flycatcher that provide for flycatcher habitat (nesting, foraging, migrating, regenerating, etc.) and allows for the changes in habitat locations or conditions from those that exist presently. The actual riparian habitat in these areas is expected to expand, contract, or change as a result of flooding, drought, inundation, and changes in floodplains and river channels (Service 2002b) that result from current flow management practices and priorities. Stream segments include breeding sites in high connectivity and other essential flycatcher habitat components needed to conserve the subspecies. Those other essential components of flycatcher habitat (foraging habitat, habitat for nonbreeding flycatchers, migratory habitat, regenerating habitat, streams, elevated groundwater tables, moist soils, flying insects, and other alluvial floodplain habitats, etc.) adjacent to or between sites, along with the dynamic process of riparian vegetation succession and river hydrology, provide current and future habitat for the southwestern willow flycatcher which is dependent upon vegetation succession.

The conservation role critical habitat river segments/units contribute to the southwestern willow flycatcher is metapopulation stability, population connectivity, gene flow, and protection against catastrophic loss of populations. Because the southwestern willow flycatcher exists in disjunct breeding populations across a wide geographic and elevation range, and is subject to dynamic events, the designated critical habitat river segments are widespread across the subspecies range. The focus of the critical habitat designation is therefore a conservation strategy which relies on protecting large southwestern willow flycatcher populations as well as small populations with high connectivity (Service 2002b). Large populations, centrally located, contribute the most to metapopulation stability, especially if other breeding populations are nearby (Service 2002b). Large populations persist longer than small ones, and produce more dispersers capable of emigrating to other populations or colonizing new areas (Service 2002b). Smaller populations in high connectivity can provide as much or more stability than a single isolated population with the same number of territories because of the potential to disperse colonizers throughout the network of sites (Service 2002b).

The approach for defining critical habitat areas supports other key central strategies tied to southwestern willow flycatcher conservation identified in the Recovery Plan (Service 2002b) such as:

1. populations should be distributed close enough to each other to allow for movement;
2. maintaining or augmenting existing populations is a greater priority than establishing new populations; and
3. a population's increase improves the potential to disperse and colonize.

Because large populations, as well as small populations with high connectivity, contribute the most to metapopulation stability (Service 2002b), we identified these areas to help guide the delineation of areas with features essential to the conservation of the southwestern willow flycatcher. The rule defines a large population as a single site or collection of smaller connected sites that support 10 or more territories.

Recovery

The 2002 final recovery plan (Service 2002b) for the southwestern willow flycatcher states that the goal of recovery efforts is the reclassification of the subspecies from endangered to threatened and, ultimately, delisting of the subspecies. The plan states that reclassification to threatened status may be considered when either of the following criteria have been met:

> Criterion A: Increase the total known population to a minimum of 1,950 territories (equating to approximately 3,900 individuals), geographically distributed to allow proper functioning as metapopulations, so that the southwestern willow flycatcher is no longer in danger of extinction. For reclassification to threatened status, these prescribed numbers and distributions must be reached as minimum, and maintained over a 5 year period.
>
> Criterion B: Increase the total known populations to a minimum of 1,500 territories (equating to approximately 3,000 individuals), geographically distributed among management units and recovery units, so that the southwestern willow flycatcher is no longer in danger of extinction. Recovery units are large watershed or hydrologic areas, while management units are a subset of the recovery units and encompass local drainages and distinct geographic features. For reclassification to threatened status, these prescribed numbers and distributions must be reached as a minimum, and maintained over a 3 year period, and the habitats supporting this subspecies must be protected from threats and loss.

The plan states that the southwestern willow flycatcher may be removed from the list of threatened and endangered species when both of the following criteria have been met:

> Criterion 1: Meet and maintain, at a minimum, the population levels and geographic distribution specified under reclassification to threatened Criterion A.
>
> Criterion 2: Provide protection from threats and create/secure sufficient habitat to assure maintenance of these populations and/or habitat over time. The sites containing southwestern willow flycatcher breeding groups, in sufficient number and distribution to warrant downlisting, must be protected into foreseeable future through development and

> implementation of conservation management agreements (e.g., public land management planning process for Federal lands, habitat conservation plans, conservation easements, and land acquisition agreements for private lands, and intergovernmental conservation agreements with Tribes). Prior to delisting, the Service must confirm that the agreements have been created and executed in such a way as to achieve their role in southwestern willow flycatcher recovery, and individual agreements for all areas within all Management Units (public, private, and Tribal) that are critical to metapopulation stability (including suitable, unoccupied habitat) must have demonstrated their effectiveness for a period of at least 5 years.

The recovery plan categorizes recovery actions into nine types: (1) increase and improve occupied, suitable, and potential breeding habitat; (2) increase metapopulation stability; (3) improve demographic parameters; (4) minimize threats to wintering and migration habitat; (5) survey and monitor; (6) conduct research; (7) provide public education and outreach; (8) assure implementation of laws, policies, and agreements that benefit the southwestern willow flycatcher; and (9) track recovery progress.

Yellow-billed cuckoo

Legal Status

The western yellow-billed cuckoo was listed as threatened on October 3, 2014 (Service 2014b). Only the Western DPS, which is larger than its eastern counterpart, was listed. Critical habitat for the cuckoo was proposed on August 15, 2014 (Service 2014c). A five-year review was initiated on June 18, 2018, but is not yet complete.

Natural History

The yellow-billed cuckoo is a member of the avian family *Cuculidae* and is a Neotropical migrant bird that winters in South America and breeds in North America. Adult yellow-billed cuckoos have a fairly stout and slightly down-curved bill; a slender, elongated body with a long-tailed look; and a narrow yellow ring of colored, bare skin around the eye. The plumage is loose and grayish brown above and white below, with reddish primary flight feathers. The tail feathers are boldly patterned with black and white below. They are a medium sized bird about 12 inches in length, and about 2 ounces in weight. The bill is blue-black with yellow on the basal half of the lower mandible. The legs are short and bluish-gray. All cuckoos have a zygodactyl foot with two toes pointing forwards and two toes pointing backwards. Juvenile yellow-billed cuckoos resemble adults, except the tail patterning is less distinct and the lower bill has little or no yellow. Males and females differ slightly and are indistinguishable in the field (Hughes 1999). Typically a secretive and hard-to detect bird, adult yellow-billed cuckoos have a distinctive ‘‘kowlp’’ call, which is a loud, nonmusical series of notes that slows down and slurs toward the end. Yellow-billed cuckoos advertise for a mate using a series of soft ‘‘cooing’’ notes, which they give at night as well as during daytime. Both members of a pair use a soft knocking call as a contact or warning call near the nest (Hughes 1999).

Yellow-billed cuckoos breed within large tracts of suitable riparian habitat. Home ranges are flexible and territories may overlap in this weakly territorial species (Hughes 1999, Halterman 2009, Sechrist et al. 2013). Rangewide, individual home ranges during the breeding season average over 100 acres (Service 2014b). However, Laymon et al. (1993) reported an average cuckoo home range size of 42 acres, and home range estimates for radio-telemetered cuckoos in New Mexico varied from 12 to 697 acres (Sechrist et al. 2009). In New Mexico, the average maximum daily distance traveled was 2,795 feet, and the average maximum seasonal distance traveled was 4,790 feet. Extensive riparian forests may support the greatest density of breeding cuckoos, but other habitats are also important for recovery (Service 2015c). Cuckoos may use narrow bands of riparian woodland for nesting (Arizona Game and Fish Department 2015, Cornell Lab of Ornithology 2015) and even non-riparian habitats (Brown 1994, Cornell Lab of Ornithology 2015, Corman and Magill 2000). Tamarisk may be a component of breeding habitat, but there is usually a native riparian tree component present (Gaines and Laymon 1984, Johnson et al. 2008, McNeil et al. 2013, Carstensen et al. 2015). Site-specific variation is likely a result of characteristics unique to each location such as type and quality of habitat or patch configuration (Hughes 1999, Halterman 2009, Sechrist et al. 2013). Habitat can be found in relatively contiguous stands of dense vegetation, in irregularly shaped mosaics of dense and open vegetation, and in patches that are narrow and linear or savannah-like. Humid conditions created by surface and subsurface moisture and a multi-layered canopy appear to be important for successful hatching and rearing of young (Hamilton and Hamilton 1965, Gaines and Laymon 1984).

Rangewide Status

Yellow-billed cuckoos spend the winter in South America, east of the Andes, primarily south of the Amazon Basin in southern Brazil, Paraguay, Uruguay, eastern Bolivia, and northern Argentina. The breeding range of the entire species formerly included most of North America from southeastern and western Canada (southern Ontario, Quebec, and southwestern British Columbia) south throughout the continental United States to the Greater Antilles and northern Mexico (Service 2014b). Currently, the species no longer breeds in western Canada and the northwestern continental United States (Washington, Oregon, and Montana).

The geographical breeding range of the yellow-billed cuckoo in western North America includes suitable habitat within the low- to moderate-elevation areas west of the crest of the Rocky Mountains in Canada, Mexico, and the United States, including the upper and middle Rio Grande, the Colorado River Basin, the Sacramento and San Joaquin River systems, the Columbia River system, and the Fraser River. In Mexico, the range includes the Cape Region of Baja California Sur, and river systems in the Mexican States of Sonora, Sinaloa, western Chihuahua, and northwestern Durango.

Western populations of the cuckoo are most commonly found in large tracks of dense, multilayered gallery forests consisting primarily of cottonwood (*Populus* spp), willow, and mesquite (*Prosopis* spp) (including mesquite bosques) along riparian corridors in otherwise arid areas (Laymon and Halterman 1989, Hughes 1999).

Within the boundaries of the DPS, cuckoos occur from sea level to elevations up to 7,000 feet or more; however, the moist conditions that support riparian plant communities typically occur at lower elevations. Cuckoo breeding habitat in much of the species' range is associated with perennial rivers and streams in regulated and unregulated flows (Poff et al. 1997). Hydrologic conditions at cuckoo breeding sites can vary widely in a single year and among years, and due to these changes cuckoos may move from one area to another in the same season and from year to year. Recent guidance on cuckoo habitat use (Service 2015c) indicates that cuckoos are more flexible in their choice of foraging and migration stopover habitat than they are in selecting nesting habitat. Foraging areas can be less dense or more patchy than nesting areas, with lower levels of canopy cover (Carstensen et al. 2015, Sechrist et al. 2009). Habitat flexibility during migration may extend to monotypic tamarisk and shrubby habitats, hedgerows, coastal scrub, orchards, and semi-desert grasslands.

The primary threat to the western yellow-billed cuckoo is loss or fragmentation of high-quality riparian nesting habitat. Many factors have altered and eliminated cuckoo habitats, including water diversions, ground water pumping, stream channelization and stabilization, agricultural development, mining, livestock grazing, wildfires, establishment of nonnative vegetation, drought, defoliation of tamarisk by the introduced tamarisk leaf beetle, and prey scarcity due to pesticides (Ehrlich et al. 1992, Corman and Wise-Gervais 2005, Service 2014a;b). Habitat fragmentation has led to the isolation of small populations and has increased their susceptibility to further declines and local extirpations due to all the factors discussed above and to stochastic factors such as weather, fluctuating prey populations, and climate change (Thompson 1961, McGill 1975, Wilcove et al. 1986). Cuckoos in the DPS were formerly widespread and locally common in much of the western U.S., Canada, and Mexico (American Ornithologists' Union 1998, Hughes 1999). The largest remaining breeding areas are in southern and central California, Arizona, New Mexico, and northwestern Mexico (Service 2014b).

Critical Habitat

In total, approximately 546,335 acres are proposed for designation as critical habitat in Arizona, California, Colorado, Idaho, Nevada, New Mexico, Texas, Utah, and Wyoming. However, there is no proposed critical habitat within the VFWO's jurisdiction.

Recovery

A recovery plan for this species has not been published. However, recovery of this species is highly dependent on ameliorating the threats to riparian systems. In particular, activities that benefit the hydrological function of the riparian system, as well as restore or conserve riparian habitat or prevent any additional loss or degradation of riparian habitat, will all benefit yellow-billed cuckoo. Avoiding application of pesticides that would limit the abundance of large insects and their larva on or in the vicinity of riparian areas at any time of year would help to maintain an adequate prey base for the cuckoo. Additionally, any management activities that would protect and enhance the physical or biological features for the western yellow-billed cuckoo by reducing or eliminating threats would aid recovery (Service 2014).

Smith's Blue Butterfly

Legal Status

The Service listed the Smith's blue butterfly as endangered on June 1, 1976 (Service 1976). Critical habitat was proposed on February 8, 1977 (Service 1977), but was not ever designated, thus, there is no designated critical habitat. The Service completed a recovery plan for the species on November 9, 1984 (Service 1984).

Natural History

Smith's blue butterflies co-occur with buckwheat plants that grow in coastal dune, cliffside chaparral, coastal scrub, and coastal grassland communities from the mouth of the Salinas River in Monterey County to San Carpoforo Creek in northern San Luis Obispo County. The Smith's blue butterfly is dependent upon its host plant species, Seacliff buckwheat (*Eriogonum parvifolium*) and coast buckwheat (*Eriogonum latifolium*), during all life stages, except that adults may also feed on nectar from naked buckwheat (*Eriogonum nudum*).

Synchronous with peak flowering of its buckwheat hosts, adult Smith's blue butterflies emerge from their pupal cases for a single flight season extending from mid-June to early September. Adults live for about 1 week, during which time they locate mates, court, and copulate. Females oviposit singly in individual flower heads. Larvae hatch 4 to 8 days after oviposition and feed on buckwheat flowers as they grow and molt through five instars. Under natural conditions, pupation occurs from early August to mid-September (Arnold 1980). The location where pupation occurs has not been adequately documented. Researchers have surmised that pupation occurs in the heads of flowers, adjacent to leaf or stem axils, in the duff, or several inches below the soil surface (Arnold 1980). Larvae overwinter as pupae and emerge as adults the following flight season.

Like many other *lycaenid* butterflies, Smith's blue butterfly larvae are tended by ants during the third through fifth instars. The larvae produce a sugary secretion upon which the ants feed. In return, the ants are presumed to provide the larvae with protection from predation or parasitism. The importance of such ant associations to the Smith's blue butterfly is currently unknown.

Rangewide Status

In the northern portion of their range, Smith's blue butterflies occur at the Salinas River National Wildlife Refuge, in the Marina area (including Marina State Beach), on Fort Ord, and in the vicinity of Sand City (Service 2006c). In the southern portion of their range, Smith's blue butterflies occur in Carmel Valley (including occupied sites at Garland Ranch Regional Park, the Santa Lucia Preserve, and Palo Corona Regional Park; Service 2006c) and along the Big Sur coast, including at least 69 sites between Cooper Point (in Monterey County near the border of Andrew Molera and Pfeiffer Big Sur State Parks) and San Carpoforo Creek (in northern coastal San Luis Obispo County; Arnold 2002). The exact elevation range of the species is unknown and

likely varies from north to south, but Smith's blue butterflies have been observed from near sea level to 2,300 feet and potential habitat occurs to approximately 2,500 feet in some locations (Arnold 1980; Service 2003c).

There are no occupied Smith's blue butterfly localities found from just south of Sand City to the Carmel Highlands (i.e., an approximately 9 mile gap occurs within the range). Smith's blue butterflies are notably absent from the Monterey Peninsula, although, historically, they have been observed just to the north at the Naval Postgraduate School and the south at Point Lobos State Reserve. Thus, Smith's blue butterflies are found within two disjunctive areas within their range; 1) a northern area of primarily dune habitats along Monterey Bay north of the Monterey Peninsula, and 2) a southern area of primarily scrub, chaparral, and grassland habitats of the Carmel Valley and Big Sur Coast south of the Monterey Peninsula (Service 2006c). Long-term monitoring has not occurred for any population of the Smith's blue butterfly. Most of our knowledge of the distribution of the Smith's blue butterfly is the result of singular observations made in the past 30 years. Therefore, the number, size, and persistence of colonies throughout the range of the species are poorly understood.

Several colonies of Smith's blue butterflies and some potential habitat are currently protected from at least some of the threats which led to its listing. Large amounts of land that have supported known colonies of the Smith's blue butterfly are owned and managed by resource agencies. Along the Monterey Bay, these areas include the Salinas River National Wildlife Refuge, Monterey State Beach, Marina State Beach, and the coastal portion of the former Fort Ord. Further south, several occupied localities and at least 574 acres of habitat have been confirmed in the Los Padres National Forest (Service 2003c).

Vegetation within the range of the Smith's blue butterfly is very dynamic, especially where stands of Seacliff buckwheat occur. Seacliff buckwheat seedlings depend upon disturbances such as landslides and other erosional features for the development of site conditions favorable for germination and establishment. Landslides and mass wasting are common along the Monterey coast and provide the disturbances required by Seacliff buckwheat; conversely, these geologic activities can also destroy existing stands of Seacliff buckwheat. The Smith's blue butterfly may benefit from some human disturbances when they mimic natural processes. The quality of habitat likely changes over relatively brief periods due to natural successional processes and, increasingly, due to the invasion of non-native plants. Over time, especially when disturbances are rare, stands of Seacliff buckwheat are likely to be displaced by larger native shrubs on all but the harshest sites.

The role of dynamic processes in creating and maintaining habitat for the Smith's blue butterfly is poorly understood. Most likely, Smith's blue butterflies abandon areas where Seacliff buckwheat is replaced by other vegetation. Adults would be expected to disperse and colonize new areas that contain adequate patches of host buckwheat plants. Arnold (1991) found that the density and age class distribution of Seacliff buckwheat and coast buckwheat are important determinants for the establishment and persistence of Smith's blue butterfly populations in some locations. The Smith's blue butterfly has a wingspan of generally less than 1 inch and adult

Smith's blue butterflies are not strong fliers; therefore, colonies may become isolated if suitable habitat is not available nearby for dispersal and colonization.

Threats to the Smith's blue butterfly exist at many of the sites that are protected from development pressures. Much of the species' habitat has been invaded and, in some cases overtaken, by invasive plants. At least 70 non-native plant species introduced during the past 200 years threaten habitat for the Smith's blue butterfly in both protected and unprotected areas throughout the sub-species' range.

The decline of the Smith's blue butterfly is attributed to degradation and loss of habitat as a result of urban development, recreational activities in dune habitats, sand mining, military activities, fire suppression in chaparral habitat, and encroachment of exotic plant species. Wildfire suppression increases the risk of large-scale, high-intensity wildfires and reduces the frequency of smaller fires. Smaller fires would be expected to create disturbances that favor establishment of Seacliff buckwheat plants; while large, high-intensity fires would be more likely to damage soils and destroy seed banks to the detriment of native plant communities. As a recent example, the 2008 Basin Complex fire burned approximately 19,424 acres of potential Smith's blue butterfly habitat. Fire intensity was variable and the effects of that fire on habitat have not been well documented, but the large size of the area burned creates concern about the ability of Smith's blue butterflies to recolonize the area. Aggressive, disturbance-oriented invasive plant species such as kikuyu grass (*Pennisetum clandestinum*), pampas grass (*Cortaderia jubata*), Cape ivy (*Delairea odorata*), and French broom (*Genista monspessulana*) are found on sites otherwise suitable for seacliff buckwheat and the Smith's blue butterfly. In sand dunes along Monterey Bay, non-native ice plant (*Carpobrotus* spp.) has covered hundreds of acres of formerly suitable habitat for the Smith's blue butterfly. The low vagility of adults, coupled with fragmentation of suitable habitat, reduce the probabilities of colonization events and migratory exchange between populations. Due to the lack of long-term monitoring, the status of the Smith's blue butterfly must be assessed largely based on the status of habitat for the species.

Urban development, recreational activities, and other activities continue to result in habitat loss and degradation. Urban development, introduction of invasive plant species and recreational use have fragmented and continue to fragment habitat for the Smith's blue butterfly. This fragmentation has several ramifications for the Smith's blue butterfly. The quality of the remaining suitable habitat is reduced, the distance dispersing adults must travel to reach the next island of suitable habitat is increased, the entire metapopulation structure is potentially disrupted, and genetic diversity is reduced. Overall, groups of Smith's blue butterflies occupying smaller, more isolated stands of suitable habitat are more likely to be extirpated by stochastic or anthropogenic factors.

Critical Habitat

There is no designated critical habitat for Smith's blue butterfly.

Recovery

The Smith's blue butterfly recovery plan was published in 1984 and is outdated. The recovery objectives in the plan focus on protection of those localities that were known when the plan was published. However, due to changes in our knowledge of the subspecies' range and the threats that it faces, the objectives are largely obsolete. The range is larger and shifted to the south, relative to what was understood in 1984, and several of the locations identified for protection in the recovery plan do not have suitable habitat or are outside the currently accepted range (Service 2003c). Of the 18 locations identified for protection in the recovery plan (Service 1984), 3 are north of the currently accepted range (Service 1986b) and 1 was likely misidentified, as it is at a higher elevation than any other occupied location and has no suitable habitat (Service 2003c).

The general recovery needs of the Smith's blue butterfly include conserving and managing existing habitat, maintaining and improving connectivity between areas of habitat, and increasing the amount of occupied habitat through restoration efforts. The Smith's blue butterfly occurs in two disjunct areas and conservation of the subspecies in both will be necessary for recovery. Although the recovery plan is outdated, several of the recovery actions it identifies are still valid, including:

1. revegetating existing blow-out areas with native plants and removing exotic plants;
2. controlling off-road vehicle use of dunes;
3. carrying out prescribed burns;
4. iceplant and Holland dune grass eradication; and,
5. developing public awareness.

ENVIRONMENTAL BASELINE

Action Area

The implementing regulations for section 7(a)(2) of the Act define the "action area" as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 Code of Federal Regulations 402.02). The action area for this biological opinion is the geographic jurisdiction of the VFWO: Santa Cruz, San Benito, Monterey, San Luis Obispo, Santa Barbara, Ventura, and the northern part of Los Angeles County (Figure 1, FEMA 2018). Please see Appendix E for species range maps within the jurisdiction of the VFWO.

Previous Consultations in the Action Area

The Service has previously issued a biological opinion with FEMA for disaster assistance projects eligible for FEMA funding with the Service under Presidential disaster declarations (FEMA-1628-DRCA and FEMA-1646-DR-CA) in 36 counties in Northern California. The PBA and corresponding PBO addressed potential effects of FEMA-funded actions on approximately 140 federally listed species and habitats. This PBO required implementation of general minimization measures and species-specific conservation measures to be implemented during each project, and authorized the take of up to 1 acre of habitat for listed species at any given project site and the cumulative take of up to 900 acres of habitat for all qualifying projects. The PBA and corresponding PBO expired on July 6, 2011.

As the action area encompasses VFWO's entire jurisdiction, numerous other consultations have been completed. A record of these consultations is available at the VFWO.

EFFECTS OF THE ACTION

FEMA has designed the implementation of their program to incorporate species conservation. They collaborated with the Service to develop a streamlined process for environmental compliance of this program. The program relies on Subapplicants voluntarily choosing a stream-lined approach for environmental compliance, and incorporating measures to avoid and minimize impacts to listed species and critical habitat into project proposals. Successful implementation of this programmatic could demonstrate an effective use of stream-lined regulatory compliance benefiting Subapplicants, species conservation, and both federal agencies.

Effects of the action on all species

The federally-listed species addressed in this programmatic consultation may be directly or indirectly harmed (e.g., killed or injured) as a result of implementing FEMA-funded projects. The effects to listed species addressed in this PBO are project-specific and widely variable. The likelihood that a proposed project will adversely affect covered species or their critical habitats depends on a variety of factors, including, but not limited to, the conditions present in the individual project action area, the probability of species occurrence, timing of the activity, and the quality and quantity of the habitat within the project footprint and its vicinity. For proposed projects covered under the PBO, we anticipate that implementation of general avoidance and minimization measures and species-specific conservation measures, as proposed, will reduce adverse effects, in some instances to levels that are insignificant, discountable, or wholly beneficial.

Activities that are likely to cause direct or indirect harm to covered species and their habitats include grading and earthmoving; road construction; excavation; maneuvering vehicles and heavy equipment on and off roads; production of noise, vibration, and dust; vegetation management; prescribed or accidental fire; placement and removal of cofferdams and other temporary water diversions in creeks and rivers; discharge of fill and sediments in water; and

placement of riprap and water control structures. Some animal species may occur in close proximity to disaster-affected areas and may be indirectly affected by project activities that extend beyond the damaged features themselves, which may include access routes, staging areas, borrow sites, and downstream effects in watercourses. Indirect effects from the covered activities can affect a species ability to breed, feed, disperse, and find shelter. Such indirect effects include the removal of cover and/or habitat, which in turn make the species more vulnerable to predation as they need to travel further to find suitable areas to breed, feed and/or find shelter. Disturbing or displacing species or host plants can reduce the likelihood of breeding, feeding, or finding shelter. Invasive non-native species may be introduced which can result in increased interspecific competition and displacement, and introductions of pathogens can lead to decreased fitness of species and make them more vulnerable to diseases.

Projects funded by FEMA under the Program are limited to repair and replacement of existing facilities and natural areas, rather than new or expanded construction. Also, many of the projects are in previously disturbed areas. Many of the effects of the proposed projects funded by FEMA will be temporary and localized; conditions are expected to return to baseline levels or become better over time periods ranging from minutes (noise) to a few years (recovery of vegetation). Other actions, while seemingly minor when implemented by themselves, may have cumulative, long-term effects over time. For example, the repair of multiple erosion sites along an earthen canal or creek with riprap will have long-term, cumulative effects both upstream and downstream of each individual project site by hardening the embankment, thereby having an effect on the system's water velocity, transport volume, and other parameters, which may include water quality.

All of the covered species may be directly or indirectly affected by temporary disturbance to, or permanent loss of, suitable habitats as a result of proposed projects. Temporary and permanent habitat disturbances can adversely affect covered species by reducing the availability of key habitat components, which species need for breeding, feeding, sheltering, and dispersing. Habitat loss and disturbance may reduce prey availability and foraging habitat, remove or damage host-plant species, reduce or remove shade cover, or cause incremental degradation or temperature increases to in-water habitats. Additionally, loss of habitat can cause an increase in both interspecific and intraspecific competition leading to displacement, which ultimately decrease an individual's fitness through reduced survival and reproductive success due to physical and physiological constraints. Construction-related habitat disturbances may cause mortality or non-lethal harm such as injury to surviving individuals by being crushed by equipment, maintenance materials, or worker foot traffic.

Although permanent loss or alteration of habitat may occur as part of a Subapplicant's proposed project, this will occur infrequently, and most project footprints are small (many less than 1 acre), which will affect only small areas. For projects such as fuel reduction, erosion, and sedimentation control, these adverse effects may occur in the short term, but may ultimately result in beneficial effects to plants, wildlife, and covered species.

Removal or reduction of habitat can result in habitat fragmentation, which also can lead to isolation and edge effects. Isolation effects can negatively impact a species ability to find suitable mates thereby reducing its reproductive success. If populations are isolated for long periods of time, this can lead to inbreeding depressions which can make the population more vulnerable to stochastic events. Edge effects generally have a negative impact on both the biotic and abiotic environments. Edge effect negatively impact species through increased risk through the introduction of invasive competitors or pathogens and an increased risk of predation. Effects to the abiotic environment can also negatively impact species by increasing water and ambient temperatures leading to physiological changes that could make the habitat unsuitable for species at all life stages.

Production of noise, vibration or dust may result in an increased vulnerability to predation or desiccation; individuals displaced from protective cover are subject to predation and accidental death or injury from vehicular or foot traffic as they move across the landscape to avoid the area. Nesting birds, may be flushed from nesting areas, abandoning nests and young in response to significant noise disturbance. Eggs and young are more vulnerable to predation when adults are flushed from nests. Difficulty hearing calls from conspecifics could reduce fitness by decreasing the ability to mate, find food, or avoid predation. The potential for disturbance and will be minimized by implementing Conservation Measures that require onsite biological monitoring, worker education programs, and successful capture and relocation of individuals. The likelihood of disturbance and displacement will be further reduced by avoidance, when feasible, and buffers. Conservation measures that minimize the area disturbed by project-related activities will reduce the potential for fleeing and abandonment as a result of the action, as will the requirement to work outside of the nesting season.

Barriers to migration and movement may be temporary (during construction) or permanent and could result in partial or localized blockage of covered species migration or movement. Effects to covered species migration or movement could differ depending on the covered species, timing, and size of the project and the nature of the activity. Such barriers could result from activities such as the conversion of land to unsuitable habitat; the loss of suitable habitat associated with vegetation management; or the repair, replacement, or construction of new highways, walls, or other infrastructure.

Implementation of the proposed conservation measures will avoid or reduce the extent and severity of adverse effects. For example, requirements to conduct work outside of the sensitive periods, for breeding, nesting, migration and dispersal periods for covered species, will reduce the effects of such activities which include human disturbance and vibration and noise of construction equipment. Restoring areas to pre-project conditions will enable species to move back into areas after project completion. Providing environmental awareness training to workers and having biological monitors onsite during all construction activities will reduce or eliminate negative encounters with individuals of any of the species. Also, clearly delineating work areas and avoidance areas using appropriate construction fencing, seasonal limitations for breeding

areas, and appropriate buffers around, for instance, vernal pools. The Conservation Measures section of this PBO provides a full description of these general and species-specific protective measures

Effects of the action on aquatic species

Increased erosion, turbidity, and sedimentation may affect aquatic species, including arroyo toads, California red-legged frog and California tiger salamander eggs and larvae, tidewater goby, and vernal pool species. Effects include reduced visibility of prey or forage items, respiratory stress, temperature changes, and in severe cases, suffocation and damage to gills, lungs, or other organs.

Heavy equipment use during in-water work activities such as installing temporary diversions or dewatering, may cause increased sedimentation. Construction-generated dust may be deposited into nearby waters and vegetation, and terrestrial or riparian vegetation removal and fuel reduction activities may increase erosion and sedimentation during storm runoff events. These activities can lead to the smothering of eggs thereby interfering with the species ability to complete its life cycle. Arroyo toad, California red-legged frog and California tiger salamander eggs may be smothered by excessive silt and larvae may have difficulty locating food in turbid waters.

Pile driving, in-water drilling, cutting, or excavation can have short-term adverse effects on covered aquatic species such as the arroyo toad, California red-legged frog, and tidewater goby, by increasing in-water noise and vibration. For example, pile driving in or adjacent to water causes high-intensity sound, which acts as a pressure wave that can collapse burrows of tidewater gobies.

For most covered projects, implementing the proposed conservation measures will likely reduce the aforementioned adverse effects to covered species, their prey, and their habitats within vernal pools and other aquatic habitat. These measures include restricting work during seasonal work windows, restricting the entry of heavy equipment into waterbodies, and establishing upland staging areas for equipment and materials. Installing silt fences, sediment curtains, and hay bales will reduce effects from erosion, turbidity, and sedimentation; the dewatering of work areas will minimize the amount and duration of suspended sediment. The Conservation Measures section of this PBO provides a full description of these general and species-specific measures.

Arroyo Toad, California red-legged frog, and California tiger salamander

In addition to the aforementioned effects for all species and for aquatic species, arroyo toad, California red-legged frog, and California tiger salamander are also susceptible to additional effects. Actions within riparian habitats, ponded features, and surrounding upland habitat for arroyo toads, California red-legged frogs, and California tiger salamanders may directly and indirectly adversely affect these species. Personnel, equipment, or materials entering the streambed or waterbody could injure or kill amphibians by trampling or crushing adults,

tadpoles, or eggs. Construction activity can lead to increased erosion and in-water work can stir up sediment; this can settle out and cover eggs leading to injury or mortality, and increase turbidity rendering adults and juveniles less able to detect prey or predators. The Subapplicant would minimize these effects by having a VFWO-approved biologist onsite, conducting pre-construction surveys, inspecting the action area and all equipment/materials, and providing construction awareness training to project staff. The Subapplicant will further minimize effects through the implementation of an Erosion Control Plan to ensure that sediment-control devices are installed and maintained, and that all disturbed soils at the site will undergo erosion control treatment before the rainy season starts. Previously disturbed or developed areas will be used for staging equipment, and heavy equipment will avoid flowing water other than temporary crossing or diverting activities.

If dewatering or heavy equipment use is necessary in occupied habitat, a VFWO-approved biologist will capture and relocate arroyo toad, California red-legged frog, and California tiger salamander individuals to minimize the chance of injury or mortality. Capture and relocation would annoy and potentially harm or kill individuals. Chytrid fungi may be spread to arroyo toad, California red-legged frogs, and California tiger salamanders during capture and relocation if done without proper handling techniques and practices.

Any individuals that avoid detection and capture and remain in the construction zone or dewatered area may be subjected to trampling, crushing, or disturbance from project activities. Egg masses or egg strands would be stranded, likely leading to mortality from desiccation. Pumping could suck in and trap eggs and tadpoles. Temporary indirect effects as a result of dewatering or heavy equipment use include reducing available habitat, altering behavior, and preventing movement of tadpoles. Altering flow by rerouting streams, dewatering, removing or installing a dam, etc. would affect these species downstream by increasing temperature, turbidity, and/or aquatic habitat availability.

The Subapplicant will avoid or minimize these effects by ensuring that water intakes will be completely screened with wire mesh not larger than 5 millimeters and the intake should be placed using a method to attenuate suction, such as a perforated bucket, to prevent arroyo toads, California red-legged frogs, and California tiger salamanders from entering the pump system. Pumped water will be carefully released so that it does not contribute to turbidity in nearby waters so as not cause to erosion and avoids and minimizes streambed structure and water flow alteration. Temporary culverts to convey live flow during construction activities will be placed at stream grade and be of an adequate size as to not increase stream velocity.

Ground disturbing activities in uplands occupied by arroyo toads, California red-legged frogs, and California tiger salamanders could directly injure or kill individuals by crushing, trampling, or entrapping adults or juveniles. Arroyo toads, California red-legged frogs, and California tiger salamanders may become trapped within natural and artificial structures by falling into trenches, sheltering in pipes, debris piles, and equipment and be injured or killed if they are not detected, captured, and relocated.

Project activities such as dredging, and installing bank protection or culverts may alter an area in a way that makes it uninhabitable for submergent and emergent vegetation. Riparian habitat is important for arroyo toads and California red-legged frogs to shelter, forage, and breed. A decrease or elimination of aquatic and riparian plants would increase this species' vulnerability to predation and desiccation and may increase water temperature due to decreased shading. To minimize these effects the Subapplicant would return contours of the streambed, vegetation, and stream flows to their pre-construction condition or better. This consultation anticipates that most activities will occur within a footprint that has been previously disturbed.

Arroyo toad, California red-legged frog and California tiger salamander riparian habitat can become isolated and fragmented due to the proposed covered activities. The fragmentation and isolation of a subpopulation can lead to a decline in dispersal between subpopulations, jeopardizing the metapopulation. The isolated populations then can become vulnerable to local extinction due to stochastic environmental and human-induced events. Additionally, removal of riparian cover can also have negative effects on reproductive success of all three species by allowing more solar radiation to heat pools and slow moving streams. Since egg masses are dependent on specific temperatures, incremental changes to water temperatures may reduce reproductive success of these amphibians. Lastly, the California tiger salamander is dependent on barrier-free landscapes for successful migration and dispersal. Thus, fragmentation or other barriers will reduce connectivity of the metapopulation, isolating subpopulations making them more vulnerable to stochastic events and less likely to be recolonized if extirpated.

The Santa Barbra Distinct DPS of California tiger salamanders are particularly vulnerable. To minimize the types of adverse effects listed above, FEMA has proposed to follow the Service's conservation strategy for the Santa Barbara DPS which requires that effects to specific metapopulations be offset such that isolation and fragmentation does not occur on a level that will lead to local extirpations. Additionally, we anticipate projects covered under this PBO will generally impact less than 1 acre of habitat each and will occur in previously disturbed areas. With implementation of the proposed conservation measures we do not anticipate these effects to cause local extirpations of any California red-legged frogs, arroyo toads, or California tiger salamander populations.

Conservancy fairy shrimp and vernal pool fairy shrimp

In addition to the aforementioned effects for all species and for aquatic species, vernal pool branchiopods are also susceptible to additional effects. Conservancy and vernal pool fairy shrimp use a variety of habitats from typical vernal pools with vegetation rings characteristic of such features, to seasonally inundated depressions that hold water for a sufficient period for branciopods to complete their life cycle but not sufficient to establish vegetation typical of vernal pools. Vernal pool habitats are in areas with specific soil, geology, and microtopography, making them highly susceptible to degradation from environmental changes. FEMA proposes to avoid direct affects to occupied habitat for conservancy and vernal pool fairy shrimp. Depending on the nature and location of the project, indirect effects could alter the hydrology, surrounding vegetation, and sedimentation rate. These indirect effects have the potential to affect the habitat

characteristics that vernal pool branchiopods require, leading to reduced or eliminated populations from affected features.

Many vernal pool areas contain hardpan soils that, if disturbed, will no longer hold water appropriately. Vernal pools also rely on runoff from surrounding areas during winter rains to refill. Re-grading these areas may affect the flow of water and alter the amount of water entering the vernal pool. These activities, as well as effects from erosion, dust, and construction activities may temporarily or permanently alter vernal pool habitat, making such areas less suitable for the covered species occupying the habitat. Vernal pool species are especially vulnerable to alterations in the existing hydrology of vernal pool habitats, because the timing, water depth, and inundation period determines which vernal-pool branchiopods are able to reproduce and persist in a given vernal pool. For example, indirect alterations to the hydrology of vernal pool habitats can result in too little soil moisture for the hatching of vernal pool branchiopod eggs. Indirect alterations to the hydrology of vernal pool habitats may also cause vernal pools to dry too fast, or cause vernal pool water temperatures to increase too soon for a vernal pool species to complete its lifecycle and reproduce.

This PBO does not cover proposed projects that involve placement of fill material in, or excavation of, any vernal pools (wet or dry) as this will require a separate section 7 consultation. However, grading, excavation and filling outside of a vernal pools may have indirect effects on vernal swales and vernal complexes by altering the natural hydrology either upstream or downstream. This can cause unseasonal drying or flooding that can negatively affect species that occupy vernal pool habitats, which can lead to species unable to complete their life cycle. Upland habitat and swales around a vernal pool and within a vernal pool complex are essential to the hydrological and biological integrity of the vernal pool and complex. Typically, if any portion of a vernal pool is affected, then the entire vernal pool is considered affected. Where the reach of these indirect effects cannot be determined definitively, the Service considers most activities in areas within 250 feet of a vernal pool to have potential for indirect effects.

The proposed general and species specific conservation measures will minimize adverse effects. These measures include pre-construction surveys, construction monitoring by a VFWO-approved biologist, establishing construction work windows and activity buffers, and identifying and flagging sensitive areas. Mortality-related effects will be minimized by buffers. The Conservation Measures section of this PBO provides a full description of these general and species-specific conservation measures.

The natural history of both Conservancy and vernal pool fairy shrimp make them difficult to locate and many areas of suitable habitat have not been surveyed. Projects that occur under this program may inadvertently occur in occupied areas. The Subapplicant would minimize the risk of this occurring by providing the Service with a habitat assessment survey completed by a VFWO-approved biologist with demonstrable experience with the diversity of habitat types in which listed branchiopod species can occur. This would include all suitable conservancy and

vernal pool fairy shrimp habitat, including the basin/inundation feature(s) where fairy shrimp and/or resting eggs would be found, and the area of the watershed needed to support the feature(s).

Tidewater goby

In addition to the aforementioned effects for all species and for aquatic species, tidewater goby are also susceptible to additional effects. Any in-water work within occupied habitat can directly affect the tidewater goby through injury or mortality caused by trampling, crushing, or entrapment. Personnel or equipment entering the streambed or waterbody could trample, crush, or entrap all life stages in burrows, and even displace individuals from their habitat if they are caught in equipment or debris during removal. Project activities that include removing debris such as wood and sediment could disturb the substrate and potentially bury burrows. The subapplicant would minimize these effects by having a VFWO -approved biological monitor onsite who would survey for tidewater gobies and assess turbidity levels within the work areas. If necessary, a VFWO -approved biologist may capture and relocate tidewater gobies to suitable habitat, which would annoy individuals and potentially lead to injury or mortality.

Debris removal may also indirectly affect this species. Project activities could reduce habitat quality by increasing turbidity and erosion, removing emergent vegetation that shade aquatic habitat, or removing submerged vegetation, substrate, or other features that are used as foraging habitat or shelter for the tidewater goby. Increasing turbidity may affect this species by decreasing water clarity and rendering individuals less able to detect prey or predators. When the particles in the water settle, burrows and eggs could be covered in sediment, thus reducing water and oxygen circulation to embryos. Removing habitat complexity such as submerged or emergent vegetation exposes tidewater gobies to increased predation from other fish and birds because it would remove shelter and shaded areas. The subapplicant would minimize these effects by preparing an Erosion Control Plan that includes erosion and sedimentation control measures for areas where disturbed substrate may potentially wash into waters via rainfall or runoff, particularly around stockpiled material and at the downstream end of each project reach. Bank stabilization activities may also be implemented to minimize erosion potential and would contain design elements suitable for supporting riparian vegetation.

Removing debris that block flow in streams and in lagoons would reduce barriers to fish movement. If debris is blocking the mouth of a lagoon, removing this debris could restore natural tidal flow and allow dispersal when the lagoon is intermittently breached, which is necessary for this species to maintain its metapopulation structure. However, artificially causing a sudden breaching event, especially outside the typical wet season, would not give this species warning through environmental cues and could flush tidewater gobies out to the ocean or strand them on sand banks, leaving them vulnerable to predation and desiccation.

Depending on the location of the project, indirect effects from road and trail, utility, and rail line construction activities could increase sedimentation and turbidity in tidewater goby habitat. The Subapplicant would minimize these effects by preparing an Erosion Control Plan that takes into

account erosion and sedimentation control measures in all areas where disturbed substrate may potentially wash into waters via rainfall or runoff, particularly around stockpiled material and at the downstream end of each project reach.

Overall, we anticipate that individual projects will be limited in size (generally affecting less than 1 acre of occupied tidewater goby habitat), and that projects will most commonly be located in previously-disturbed areas. With implementation of the avoidance and minimization measures, we do not anticipate that actions covered under this PBO will cause, or substantially contribute to, the extirpation of any occupied estuary/lagoon.

California gnatcatcher and Riparian Birds: Least Bell's vireo, southwestern willow flycatcher, and yellow-billed cuckoo

Coastal California gnatcatchers and the listed riparian birds (least Bell's vireo, southwestern willow flycatcher, and yellow-billed cuckoo) may be indirectly affected by project activity through disturbance and habitat modification. Increased activity and significant noise disturbance and vibration from heavy machinery operation and foot traffic in riparian corridors or scrub habitat can cause these species to abandon the habitat and potentially abandon nesting attempts or active nests. Eggs and young are more vulnerable to predation when adults are flushed from nests.

The riparian birds are migratory and are only anticipated to be present during spring summer months, but coastal California gnatcatchers are non-migratory and will be present year-round. Activities that disturb habitat for riparian birds in the non-breeding season, can have adverse effects to birds returning to their territories the following year. Activities that disturb habitat for coastal California gnatcatchers can have impacts to the birds year-round; however during the non-breeding season gnatcatchers can move away from work areas to other suitable habitat. To minimize effects to nesting birds, clearing of vegetation within occupied, or potential suitable habitat will occur outside the respective breeding seasons to the maximum extent possible. If work must proceed during the breeding season, surveys will be conducted to identify and avoid nesting birds by establishing no-work buffer zones around nests. Despite efforts to identify and avoid nesting birds, adverse effects may still occur if birds are missed during surveys, or if surveys and project activities displace birds from otherwise suitable habitat.

Since nests will be protected from direct impacts, eggs and nestlings will not be directly impacted under the proposed action. However, the proposed projects could result in the removal of vegetation, thus reducing the availability of foraging and nesting resources. Project activities could also result in the introduction and/or spread of the nonnative plant species, particularly giant reed, which can form dense stands that are unsuitable for riparian birds. Destruction of habitat outside the breeding season could impact individuals returning to previous nest sites. Individuals could be forced to compete with each other when attempting to expand an existing territory or establish a new territory or miss the opportunity to breed. Also, if displaced birds cannot find suitable habitat to forage and shelter in, they will be more vulnerable to predation and may die or be injured. Individuals that successfully establish territories in adjacent habitat

are expected to experience reduced productivity (e.g., delayed initiation or prevention of nest building, fewer nesting attempts per season, and/or overall reduction in reproductive output) due to reduced availability of foraging and breeding habitat and increased territorial interactions.

Projects that require lighting could result in direct and indirect effects on the covered species. Direct effects to covered bird species will be primarily associated with changes in behavior. Lights may cause disruption, such as disorientation, in local, seasonal, or long-distance dispersal or migration events. These effects may be temporary or permanent, and may alter breeding or foraging behaviors, or affect the ability of species to find or return to breeding territories.

No permanent loss of occupied or designated critical habitat will occur within or outside of the breeding season under this PBO. For any specific project, temporary impacts on occupied or designated critical habitat will be limited to a maximum of 1 acre. Temporary impacts from all the projects covered under this PBO will also be limited to a maximum of 20 acres of occupied or designated critical habitat.

Smith's blue butterfly

Ground disturbance or vegetation clearing in areas of occupied Smith's blue butterfly habitat could directly affect this species if larvae or pupae associated with host buckwheat plants or in the surrounding soil are crushed, trampled, or entombed, leading to injury or death. Foot and vehicular traffic from constructing or modifying facilities, along with ongoing disturbance from operation and maintenance of these facilities, could startle Smith's blue butterflies and cause them to abandon a safe area, thus making them more vulnerable to predation or collisions with vehicles.

If seacliff or coast buckwheat plants must be removed during the implementation of a project, this not only could lead to injury or mortality by directly removing larvae living on host plants or pupae in surrounding soil and duff, but it would also remove habitat for Smith's blue butterfly. In addition to reducing sheltering and foraging opportunities for this species, habitat loss can also decrease connectivity and lead to isolated populations that are less resilient to stochastic events. The Subapplicant would minimize these effects by having a VFWO-approved biologist onsite in areas with buckwheat plants, implementing measures such as restricting speed limits to 20 mph when travelling off of highways or county roads (15 mph in the project footprint), holding a construction awareness training for project staff, and avoiding damage or removal of seacliff and coast buckwheat. Furthermore, relocating facilities and roads to areas that do not contain or encroach on suitable habitat (thereby reducing foot and vehicular traffic), along with revegetating areas with native species could be beneficial to the species.

Construction-related noise can also adversely affect covered butterfly species, by startling them away from a safe area thus making them more vulnerable to collisions with vehicles and equipment and predation by other species.

Effects to Critical Habitat

As described above, the Action Area encompasses the entire VFWO jurisdiction and all critical habitat units within the VFWO's jurisdiction for the arroyo toad, California red-legged frog, California tiger salamander (Central DPS and Santa Barbara DPS), conservancy fairy shrimp, coastal California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, tidewater goby, and vernal pool fairy shrimp. The Service anticipates that projects funded by FEMA could negatively affect some of the critical habitat units and PBFs for these species within the Action Area.

Arroyo toad Critical Habitat

The Service anticipates effects could occur to PBF 1 (rivers or streams), PBFE 2 (alluvial streamside terraces), and PBF 4 (dispersal and connectivity habitat) through implementation of a variety of ground disturbing activities associated with individual projects covered under the PBO. PBF 3 (flooding regime) may be impacted by installation of structures that modify the hydrogeology of arroyo toad habitat, such as levees or other hardened surfaces. These effects would be minimized by FEMA's proposed measure to avoid permanent impacts to critical habitat unless the impact is so small that it will have a negligible effect on habitat quality for arroyo toads. Therefore, we do not expect any appreciable reduction in the ability of the critical habitat to provide for the survival and recovery of arroyo toads.

California Red-Legged Frog Critical habitat

The Service anticipates that the activities associated with the proposed action could negatively affect PBF 1 (aquatic breeding habitat), PBF 2 (non-breeding aquatic habitat), PBF 3 (upland habitat), and PBF 4 (dispersal habitat) of the California red-legged frog critical habitat within the Action Area. However, these activities will likely result in minor effects to habitat as most projects will restore the area to pre-disaster conditions. The Action Area contains aquatic breeding and non-breeding habitat (PBFs 1 and 2) in the form of ponds, creeks, and streams. This habitat could be affected by construction activities through erosion from project activities such as culvert replacement, though following conservation measures will minimize these effects. However, constructing flood control structures such as levees could channelize the applicable waterway permanently affecting the PBFs making them less suitable for the California red-legged frog. Some permanent activities are proposed such as constructing new facilities or relocating existing facilities outside of disaster prone areas. These activities will permanently affect upland and dispersal habitat (PBFs 3 and 4) by installing structures on high quality habitat which will remove upland areas for the California red-legged frog to hide and will create barriers to movement to and from aquatic areas. However, the footprint of the project will confine these effects to a small area. When implemented with both the general and species-specific conservation measures, these proposed activities will not prevent critical habitat from providing essential conservation values for the California red-legged frog. Therefore, we do not expect any appreciable reduction in the ability of the critical habitat to provide for the survival and recovery of California red-legged frogs.

California Tiger Salamander (Central California and Santa Barbara DPS) Critical Habitat

The Service anticipates that the activities associated with the proposed action could negatively affect PBF 1 (aquatic breeding habitat), PBF 2 (upland habitat), and PBF 3 (dispersal habitat) of the California tiger salamander critical habitat within the Action Area. However, these activities will likely result in minor effects to habitat as most projects will restore the area to pre-disaster conditions. Activities with a larger effect are those that will construct new facilities such as developing demonstration projects. These projects have to potential to fill aquatic breeding habitat (PBF 1), excavate and fill burrow systems (PBF 2), and construct barriers that prevent movement to and from breeding sites (PBF 3). When implemented with both the general and species-specific conservation measures, these activities will not prevent critical habitat from providing essential conservation values for the California tiger salamander. Therefore, we do not expect any appreciable reduction in the ability of the critical habitat to provide for the survival and recovery of California tiger salamander.

Conservancy Fairy Shrimp and Vernal Pool Fairy Shrimp Critical Habitat

The Service anticipates that the activities associated with the proposed action could negatively affect PBF 1 (topographic features), PBF 2 (depressional features), PBF 3 (food sources), and PBF 4 (shelter) of the vernal pool branchiopods critical habitat within the Action Area. However, these activities will likely only result in minor effects to habitat as most projects will restore the area to pre-disaster conditions. Activities associated with the proposed action could negatively impact all four PBFs if activities are located adjacent to vernal pool branchiopod critical habitat. The habitat could be affected by construction activities that divert extra water to or from the vernal pool critical habitat. Altering the topography of adjacent sites could negatively impact PBF 2 by altering the frequency and duration of filling. Additionally, this change could affect prey species (PBF 3) and vernal pool plants that provide shelter (PBF 4). However, project footprints will confine these effects to a small area. When implemented with both the general and species-specific conservation measures, these activities will not prevent critical habitat from providing essential conservation values for the vernal pool branchiopods. Therefore, we do not expect any appreciable reduction in the ability of the critical habitat to provide for the survival and recovery of conservancy fairy shrimp and/or vernal pool fairy shrimp.

Coastal California Gnatcatcher Critical Habitat

The Service anticipates effects could occur to PBFs 1 (i.e., sage scrub) and 2 (i.e., non-sage scrub habitat associated with sage scrub, including chaparral, grassland, and riparian habitat) of gnatcatcher critical habitat via removal during construction and maintenance activities. However, temporary impacts from all will be limited to a maximum of 1 acre of designated critical habitat per project and twenty acres of gnatcatcher designated critical habitat overall and no permanent loss of habitat is expected. Thus, impacts should be small in scale, spread out over the range of the species, and intermittent over the life of the project and impact a small proportion of the approximately 197,303 acres of designated critical habitat for this species. Therefore, no appreciable reduction in the ability of the critical habitat to provide for the survival and recovery

of this species is expected. Therefore, we do not expect any appreciable reduction in the ability of the critical habitat to provide for the survival and recovery of coastal California gnatcatcher.

Least Bell's Vireo Critical Habitat

The Service anticipates that activities associated with the proposed action could negatively affect the PBFs, which are described as riparian woodland vegetation that generally contains both canopy and shrub layers, and includes some associated upland habitats. Activities that may negatively affect least Bell's vireo critical habitat include removal or destruction of riparian vegetation; thinning of riparian growth, particularly near ground level; removal or destruction of adjacent chaparral or other upland habitats used for foraging; and increases in human-associated or human-induced disturbance. The overall area of critical habitat that is anticipated to be impacted by projects covered under this PBO is small in comparison to any individual critical habitat unit. FEMA proposes no permanent loss of designated critical habitat for least Bell's vireo, unless the impacts are determined to have a negligible effect on habitat quality for least Bell's vireo. Therefore, no appreciable reduction in the ability of the critical habitat to provide for the survival and recovery of least Bell's vireo is expected.

Southwestern Willow Flycatcher Critical Habitat

The Service anticipates that activities associated with the proposed action could negatively affect PBF 1(riparian habitat) and PBF 2 (a variety of insect prey). Activities that may negatively affect southwestern willow flycatcher critical habitat include removal or destruction of riparian vegetation; thinning of riparian growth; and increases in human-associated or human-induced disturbance. The overall area of critical habitat that is anticipated to be impacted by projects covered under this PBO is small in comparison to any individual critical habitat unit. FEMA proposes no permanent loss of designated critical habitat for southwestern willow flycatcher, unless the impacts are determined to have a negligible effect on habitat quality for southwestern willow flycatcher. Therefore, no appreciable reduction in the ability of the critical habitat to provide for the survival and recovery of southwestern willow flycatcher is expected.

Tidewater Goby Critical Habitat

The Service anticipates that the activities associated with the proposed action could negatively affect PBF 1a (substrate), PBF 1b (aquatic vegetation), PBF 1c (sandbars) of the tidewater goby critical habitat within the Action Area. However, these activities will likely result in minor effects to habitat as most projects will restore the area to pre-disaster conditions. As the specific PBFs are flexible depending on the water level, repairing coastal features such as coastal flood-control structures could affect the PBFs by shrinking the amount of available habitat that fall within the PBFs should the repair extend outside of the original footprint. When implemented with both the general and species-specific conservation measures, these activities will not prevent critical habitat from providing essential conservation values for the tidewater goby.

Therefore, no appreciable reduction in the ability of the critical habitat to provide for the survival and recovery of tidewater goby is expected.

Summary of effects to Critical Habitat

Most of the covered activities will only result in minor effects limited to small areas. These activities are not likely to diminish the quality of PBFs in a unit for any of the covered species critical habitat. While disturbance within critical habitat may prevent some covered species from using portions of the critical habitat for essential life function whether temporarily or permanently, they will still be able to complete their essential ecological and biological functions in the remaining areas of critical habitat. Therefore, all critical habitat units will retain their PBFs and the PBFs within each critical habitat unit for each covered species will still remain functional. Consequently, the designated critical habitat for all covered species will still be able to perform its intended functions and conservation role.

In conclusion, the Service determines that the majority of activities associated with any proposed projects will result in only minor effects to PBFs, and with implementation of the conservation measures, will not prevent critical habitat from providing essential conservation values. The restoration of native vegetation, removing invasive species, improving water quality and hydrology, stabilizing eroding banks, reducing sedimentation, replacing structures that form partial or complete barriers to movement, and vegetation management to reduce wildfire risk will have negligible or beneficial effects to critical habitat. This determination is further based on the fact that projects funded by FEMA primarily will occur in previously disturbed areas, and the project footprint of most individual projects will be small in size and impact. The Service anticipates that habitat loss and degradation at individual project sites will be minimal and implementation of conservation measures will further minimize effects.

Effects to Recovery

The proposed activities do not conflict with the recovery actions or goals described in the draft recovery plan or the 5-year review because permanent loss of habitat is not expected and temporary impacts should be small in scale, spread out over the range of the species, and intermittent over the life of project activities. Further, the potential for impacts from the project activities are effectively minimized due to the proposed conservation measures. Finally, the number of individuals that may be affected is a small proportion of the total and regional populations. Additionally, we do not expect the proposed project to appreciatively reduce the recovery capacity of any of the 12 listed entities covered in this PBO because FEMA, in coordination with the Service, has developed procedures for implanting its disaster mitigation, and preparedness programs within the context of listed species conservation. In addition to the comprehensive list of conservation measures that are directed towards the protection of the habitat and, therefore, the long-term protection of individual species, FEMA has committed to educating Subapplicants about species conservation and encouraging them to proactively implement conversation measures; educating Subapplicants on conservation efforts at the project design and project planning levels; and is incorporating an ecosystem services approach into

FEMA's decision-making process. Thus, overall, FEMA's commitment to implement a meaningful section 7(a)(1) program within their authority will likely help improve the status of the species covered in this PBO.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this PBO. We do not consider future Federal actions that are unrelated to the proposed action in this section because they require separate consultation pursuant to section 7 of the Act. The following actions may affect the species covered in this PBO by directly or indirectly harming individuals or by adversely affecting designated or proposed critical habitats.

An undetermined number of future land use conversions and routine land management practices are anticipated to be implemented and are often not reviewed for environmental compliance under the federal permitting process. These activities may alter the habitat or increase incidental take of federally-listed species and are cumulative to the proposed programmatic actions. These cumulative effects include, for example:

- Ongoing land conversion leading to continued habitat loss, fragmentation, or degradation;
- Increased recreational activities such as off-road vehicle use, golf courses, species collecting, bike and equestrian use, wave action in water channels caused by boats;
- Increased mining, oil and gas exploration and production, incompatible grazing, and unsustainable timber harvesting;
- Increased invasive species and predation that generally accompany urban expansion;
- Increased mosquito abatement programs (that introduce exotic fish into breeding and non-breeding ponds impact the reproductive success of amphibians.
- Dredging and clearing of vegetation from irrigation canals;
- Deep-ripping, discing or mowing upland habitat;
- Use of burrow fumigants on levees or in other potential upland refugia;
- Use of plastic erosion control netting; and
- Point and non-point source chemical contaminant discharges (e.g., selenium, pesticides, herbicides, fuels, and other toxic substances).

CONCLUSION

The regulatory definition of "to jeopardize the continued existence of the species" focuses on assessing the effects of the proposed action on the reproduction, numbers, and distribution, and their effect on the survival and recovery of the following species being considered in the PBO:

- Arroyo toad
- California red-legged frog
- California tiger salamander – Central California DPS and Santa Barbara DPS
- Conservancy fairy shrimp

- Vernal pool fairy shrimp
- Tidewater goby
- Coastal California gnatcatcher
- Least Bell's vireo
- Southwestern Willow Flycatcher
- Yellow-billed cuckoo
- Smith's blue butterfly

Reproduction

FEMA and the Service worked extensively in coordinating a comprehensive suite of general and species-specific conservation measures designed with species conservation in mind. While temporary decreased fitness to individuals may occur as a result of projects implemented under this PBO, we do not expect those effects to be significant or meaningful at a population or species level. Consequently, we do not anticipate the actions covered within this PBO to impact reproduction of any of the listed species to the extent that it "reduces appreciably the likelihood of both the survival and recovery" of the aforementioned species.

Numbers

FEMA and the Service worked extensively in coordinating a comprehensive suite of general and species-specific conservation measures designed with species conservation in mind. While temporary reduction of numbers may occur within individual populations as a result of projects implemented under this PBO, we do not expect those effects to be significant or meaningful at a population or species level. Consequently, we do not anticipate the actions covered within this PBO to impact the numbers of any of the listed species to the extent that it "reduces appreciably the likelihood of both the survival and recovery" of the aforementioned species.

Distribution

FEMA and the Service worked extensively in coordinating a comprehensive suite of general and species-specific conservation measures designed with species conservation in mind. While temporary impacts to individuals may occur as a result of projects implemented under this PBO, we do not expect those effects to be significant or meaningful at a population or species level. Consequently, we do not anticipate the actions covered within this PBO to impact distribution of any of the listed species to the extent that it "reduces appreciably the likelihood of both the survival and recovery" of the aforementioned species.

After reviewing the current status of the 12 listed entities covered by this PBO, the species' status, environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that FEMA's Program in California, as proposed, is not likely to jeopardize the continued existence of the following species:

The Service reached this conclusion because the project-related effects to the species, when

added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding recovery or reducing the likelihood of survival of the species based on the following:

(1) FEMA, in coordination with the Service, has proposed an extensive suite of general and species-specific conservation measures to be implemented for each project that are directed towards the protection of the habitat and, therefore, the long-term protection of individual species; (2) most individual project areas will have small footprints (less than 1 acre), therefore, not all populations or habitats will be affected by the proposed actions; and (3) FEMA will initiate individual section 7 consultations on all actions involving species and projects that do not specifically qualify for coverage under this PBO, as described in the PBA.

Critical Habitat

After reviewing the current status of the designated critical habitat, the environmental baseline of critical habitat for the action area, the effects of the proposed action(s) on critical habitat, and the cumulative effects, it is the Service's biological opinion that the action(s), as proposed, is not likely to result in the destruction or adverse modification of critical habitat of the following species:

- Arroyo toad
- California red-legged frog
- California tiger salamander – Central California DPS and Santa Barbara DPS
- Conservancy fairy shrimp
- Vernal pool fairy shrimp
- Tidewater goby
- Coastal California gnatcatcher
- Least Bell’s vireo
- Southwestern Willow Flycatcher

The Service reached this conclusion because the project-related effects to the designated critical habitat for these species will not rise to the level of precluding the function of the respective critical habitat to serve its intended conservation role for the species based on the following: (1) FEMA, in coordination with the Service, has proposed an extensive suite of general and species-specific conservation measures that will be implemented for each project; (2) the majority of the effects of the projects are temporary and not persistent; (3) most of the projects restore structures such as roads, bridges, or other pre-existing facilities that are not in themselves physical and biological features essential to species’ conservation; and (4) the effects to critical habitat for these species are small and discrete, relative to the entire area designated, and are not expected to appreciably diminish the value of the critical habitat or prevent it from sustaining its role in the conservation of these species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened wildlife species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not the purpose of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

In June 2015, the Service finalized new regulations implementing the incidental take provisions of section 7(a)(2) of the Act. The new regulations also clarify the standard regarding when the Service formulates an Incidental Take Statement [50 CFR 402.14(g)(7)], from "…if such take may occur" to "…if such take is reasonably certain to occur." This is not a new standard, but merely a clarification and codification of the applicable standard that the Service has been using and is consistent with case law. The standard does not require a guarantee that take will result; only that the Service establishes a rational basis for a finding of take. The Service continues to rely on the best available scientific and commercial data, as well as professional judgment, in reaching these determinations and resolving uncertainties or information gaps.

AMOUNT OR EXTENT OF TAKE

We anticipate that some arroyo toads, California red-legged frogs, California tiger salamanders (Central California and Santa Barbara Distinct Population Segments), California coastal gnatcatcher, conservancy fairy shrimp, least Bell's vireo, smith's blue butterfly, southwestern willow flycatcher, tidewater goby, and yellow-billed cuckoos could be taken as a result of the proposed action. We expect the incidental take to be in the form of lethal and non-lethal harm through capture and relocation, habitat disturbance that displaces listed species, or activities in occupied habitat that results in injury or death of listed species.

We cannot quantify the precise number of covered species that may be taken as a result of the actions that FEMA has proposed for multiple reasons. Individuals move over time; for example, animals may have entered or departed the action area since the time of pre-construction surveys. Other individuals may not be detected due to their cryptic nature, small size, and low mobility. The protective measures proposed by FEMA are likely to prevent mortality or injury of most individuals. In addition, finding a dead or injured covered species is unlikely.

Consequently, we are unable to reasonably anticipate the actual number of covered species that would be taken by the proposed project; however, we must provide a level at which formal consultation would have to be reinitiated. The Environmental Baseline and Effects Analysis sections of this PBO indicate that adverse effects to covered species would likely be low given the extensive suite of conservation measures, and we, therefore, anticipate that take of covered species would also be low. We also recognize that for every individual found dead or injured, other individuals may be killed or injured that are not detected, so when we determine an appropriate take level we are anticipating that the actual take would be higher and we set the number below that level.

Arroyo Toad

The Service anticipates that incidental take of the arroyo toad associated with FEMA's proposed action may occur from project activities within occupied aquatic and upland habitat. Individuals may be subject to take in the form of non-lethal harm during relocation of animals that are found in the work area, and take in the form of injury or death if arroyo toads go undetected in the work area and are crushed or otherwise directly or indirectly impacted by project activities. The Service anticipates impacts to not more than 1 acre of occupied habitat at any given project site, and a maximum of 10 acres of impacts to occupied habitat overall for all projects for the five-year term of the PBO.

The Service anticipates and is exempting take incidental to the proposed action in the form of harm, injury, or death of no more than three juvenile or adult arroyo toads and no more than 1 egg strand per site per year; and/or no more than 20 juveniles or adult arroyo toads and no more than 5 egg strands total for all sites for the 5-year duration of this PBO. Additionally, the service is exempting all take in the form of capture and relocation for the project footprint.

Accordingly, the Service concludes that the incidental take of arroyo toads will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. More than one (1) acre of occupied habitat is impacted at any given project site;
2. More than ten (10) acres of occupied habitat are impacted during the 5-year duration of the PBO;
3. Death or injury of more than three (3) juvenile or adult arroyo toads and one (1) egg strand at any individual site;
4. Death or injury of more than twenty (20) juveniles or adults and five (5) egg strands for the 5-year duration of the PBO.

California Red-legged Frog

The Service anticipates that incidental take of California red-legged frogs associated with FEMA's proposed action may occur from project activities within occupied aquatic and upland habitat. Individuals may be subject to take in the form of non-lethal harm during relocation of

animals that are found in the work area, and harm in the form of injury or death if California red-legged frogs go undetected and are crushed or otherwise directly or indirectly impacted by project activities. The Service anticipates that individual projects will generally impact 1 acre of occupied habitat or less, and a maximum of 50 acres of impacts to occupied habitat will occur overall for all projects during the five-year term of the PBO.

The Service anticipates and is exempting take incidental to the proposed action in the form of harm, injury, or death of no more than three juvenile or adult California red-legged frogs and no more than 1 egg mass per site per year; and/or no more than 30 juveniles or adult California red-legged frogs and no more than 5 egg masses total for all sites for the 5-year duration of this PBO. Additionally, the service is exempting all take in the form of capture and relocation for the project footprint.

Accordingly, the Service concludes that the incidental take of California red-legged frogs will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. More than fifty (50) acres of occupied habitat are impacted during the five-year term of the PBO;
2. Death or injury of more than three (3) juvenile or adult California red-legged frogs or one (1) egg mass at any individual site; or
3. Death or injury of more than thirty (30) juveniles or adults and five (5) egg masses total for all sites for the 5-year duration of the PBO.

<u>California Tiger Salamander – Central California DPS</u>

The Service anticipates that incidental take of California tiger salamanders in the Central California DPS may occur during FEMA's proposed from project activities that directly and indirectly affect occupied aquatic and upland habitat. Individuals may be subject to take in the form of non-lethal harm during relocation of California tiger salamanders that are found in the work area, and harm in the form of injury or death if California tiger salamanders go undetected and are crushed or otherwise impacted by project activities. The Service anticipates that individual projects will impact 1 acre of occupied habitat or less, and a maximum of 20 acres of impacts to occupied habitat will occur overall for all projects during the five-year term of the PBO.

The Service anticipates and is exempting take incidental to the proposed action in the form of harm, injury, or death of no more than three juvenile or adult California tiger salamanders per site per year; no more than 30 juveniles or adult California tiger salamanders total for all sites for the 5-year duration of this PBO. Additionally, the service is exempting all take in the form of capture and relocation for the project footprint.

Accordingly, the Service concludes that the incidental take of California tiger salamanders will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. More than one (1) acre of occupied habitat is impacted at any given project site;
2. More than twenty (20) acres total of occupied habitat is impacted by all projects over the 5-year duration of the PBO;
3. Death or injury of more than three (3) juvenile or adult California tiger salamanders at any individual project site; or
4. Death or injury of more than ten (30) juvenile or adults California tiger salamanders for all sites for the 5-year duration of the PBO.

California Tiger Salamander – Santa Barbara DPS

The Service anticipates that incidental take of California tiger salamanders in the Santa Barbara DPS may occur during FEMA's proposed from project activities that directly and indirectly affect occupied aquatic and upland habitat. Individuals may be subject to take in the form of non-lethal harm during relocation of California tiger salamanders that are found in the work area, and harm in the form of injury or death if California tiger salamanders go undetected and are crushed or otherwise impacted by project activities. The Service anticipates that individual projects will impact 1 acre of occupied habitat or less, and a maximum of 20 acres of impacts to occupied habitat will occur overall for all projects during the five-year term of the PBO.

The Service anticipates and is exempting take incidental to the proposed action in the form of harm, injury, or death of no more than three juvenile or adult California tiger salamanders per site per year; no more than 15 juvenile or adult California tiger salamanders total for all sites for the 5-year duration of this PBO. Additionally, the service is exempting all take in the form of capture and relocation for the project footprint.

Accordingly, the Service concludes that the incidental take of California tiger salamanders will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. More than one (1) acre of occupied habitat is impacted at any given project site;
2. More than twenty (20) acres of habitat are impacted by all projects over the 5-year duration of the PBO;
3. Death or injury of more than three (3) juvenile or adult California tiger salamanders per site per year; or
4. Death or injury of more than fifteen (15) juveniles or adults total for all sites for the 5-year duration of the PBO.

Coastal California Gnatcatcher

The Service anticipates that incidental take of the coastal California gnatcatcher associated with FEMA's proposed action may occur from habitat removal. We anticipate take in the form of harm associated with habitat removal that may cause individuals to be displaced from their territories, or may cause injury or death of adults, chicks, and eggs. We expect that individual projects will not have impacts to more than 1 acre of occupied coastal California gnatcatcher habitat. Impacts from all projects covered under this consultation will be limited to a maximum of 20 acres of coastal California gnatcatcher occupied habitat.

The Service anticipates and is exempting take incidental to the proposed action in the form of harm, injury, or death of no more than one adult coastal California gnatcatcher or one nest containing coastal California gnatcatcher eggs or chicks for the 5-year duration of this PBO.

Accordingly, the Service concludes that the incidental take of coastal California gnatcatcher will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. More than one (1) acre of occupied habitat at any given project site is impacted;
2. More than twenty (20) acres occupied habitat are impacted by all projects during the 5-year duration of the PBO;
3. More than one (1) coastal California gnatcatcher adult is found dead or injured; or
4. More than one (1) coastal California gnatcatcher nest containing eggs or chicks is damaged or destroyed.

Conservancy Fairy Shrimp and Vernal Pool Fairy Shrimp

The Service anticipates that direct impacts to occupied basin/inundation features will be avoided; however, project activities in the watershed surrounding occupied features may cause take of conservancy fairy shrimp and/or vernal pool fairy shrimp through indirect effects. An indeterminable number of vernal pool fairy shrimp would be subject to take in the form of injury or mortality from the proposed activities. We cannot predict the exact number of vernal pool fairy shrimp that may be affected by the project activities because of fluctuations in population sizes between years and the species random distribution in the environment. Because of their small size, finding dead or injured vernal pool fairy shrimp is unlikely. The Service is providing a mechanism (number of basin/inundation features affected) to quantify when we will consider take to be exceeded as a result of the proposed project. We have determined that project activities within 250 feet of a basin/inundation area have the potential to have indirect effects that may result in take of Conservancy fairy shrimp and vernal pool fairy shrimp. With implementation of the conservation measures, take is not anticipated to occur from activities greater than 250 feet from occupied basin/inundation features.

Therefore, the Service anticipates that no more than 5 basin/inundation features would be affected by any individual project, and not more than 25 features would be affected over the 5-year term of the PBO. A basin/inundation feature will be considered affected if project activities occur within 250 feet of occupied habitat. Additionally, a basin/inundation feature may include a complex of small depressions or areas of inundation (e.g., tire ruts or other similarly-sized depressions) that would count as one feature for the purpose of quantifying incidental take. Accordingly, the Service concludes that the threshold for incidental take of conservancy fairy shrimp and/or vernal pool fairy shrimp will be considered exceeded under one or more of the following conditions. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. More than five (5) basin/inundation features are affected by any individual project; or
2. More than twenty-five (25) basin/inundation features are affected during the 5-year term of the PBO.

Least Bell's Vireo

The Service anticipates that incidental take of the least Bell's vireo associated with FEMA's proposed action may occur from habitat removal during the non-breeding season (affecting birds returning to impacted territories the following breeding season) or from project activities that occur during the breeding season that may displace adults and kill juveniles or eggs. We anticipate that any individual project would not exceed 1 acre of least Bell's vireo habitat disturbance, within which a maximum of two pairs of least Bell's vireos may be impacted by being displaced from their territory and be subject to non-lethal harm. Temporary impacts from all projects covered under this consultation will be limited to a maximum of 20 acres of least Bell's vireo occupied habitat, within which a maximum of 40 least Bell's vireo pairs that would be impacted.

The Service anticipates and is exempting take incidental to the proposed action in the form of non-lethal harm to a maximum of 40 least Bell's vireos within 20 acres of habitat; and harm in the form of injury or death of no more than two adult least Bell's vireos or one nest containing least Bell's vireo eggs or chicks for the 5-year duration of this PBO.

Accordingly, the Service concludes that the incidental take of least Bell's vireo will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. More than one (1) acre of occupied habitat at any given project site is impacted by any individual project;
2. More than twenty (20) acres of occupied habitat are impacted by all projects during the 5-year term of the PBO;
3. More than one (1) least bell's vireo adult is found dead or injured; or
4. More than one (1) least Bell's vireo nest containing eggs or chicks is damaged or destroyed.

Smith's Blue Butterfly

The Service anticipates that incidental take of Smith's blue butterflies will be difficult to detect because the Smith's blue butterfly has a small body size and finding dead or injured individuals is unlikely. While adults and larvae might occasionally be located through careful surveys by trained personnel, take of eggs and pupae would be nearly impossible to detect. We have further concluded that the use of habitat as a surrogate for the take of individual butterflies is appropriate because reliance on finding killed or injured individuals would likely underestimate the actual effects of the actions; i.e., the number of individual butterflies found dead or injured is going to be lower than what actually occurs. Since we cannot estimate the number of individual Smith's blue butterfly that will be incidentally taken for the reasons listed above, the Service is providing a mechanism (acres) to quantify when we will consider take to be exceeded as a result of the proposed project. Since we expect take to result from the proposed project's effects to habitat, the quantification of habitat becomes a direct surrogate for the species that will be taken.

Therefore, the Service anticipates that all Smith's blue butterflies within occupied habitat that would be impacted by project activities will be subject subject to incidental take in the form of harm, injury, or mortality. The Service anticipates and is exempting the take of not more than 1 acre of occupied habitat at any given project, and no more than 10 total acres of occupied habitat over the five-year term of the PBO.

Accordingly, the Service concludes that the incidental take of Smith's blue butterfly will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. More than one (1) acre of occupied habitat is impacted by project activities at any individual project site; or
2. More than ten (10) acres of occupied habitat are impacted by all projects over the five-year term of the PBO.

Southwestern Willow Flycatcher

The Service anticipates that incidental take of the southwestern willow flycatcher associated with FEMA's proposed action may occur from habitat removal during the non-breeding season (affecting birds returning to impacted territories the following breeding season) or from project activities that occur during the breeding season that may displace adults and kill juveniles or eggs. We anticipate that any individual project would not exceed 1 acre of southwestern willow flycatcher habitat disturbance, within which a maximum of two pairs of southwestern willow flycatcher could be impacted by being displaced from their territory and be subject to non-lethal harm. Due to the very low density of southwestern willow flycatchers within the action area, this is likely an overestimate of take that would occur. Temporary impacts from all projects covered under this consultation will be limited to a maximum of 20 acres of southwestern willow flycatcher habitat, within which we estimate that a maximum of 12 southwestern willow flycatcher pairs could be impacted through non-lethal harm over the 5-year duration of the PBO.

The Service anticipates and is exempting take incidental to the proposed action in the form of non-lethal harm to a maximum of 12 southwestern willow flycatchers within 20 acres of habitat; and harm in the form of injury or death of no more than one adult southwestern willow flycatcher or one nest containing southwestern willow flycatcher eggs or chicks for the 5-year duration of this PBO.

Accordingly, the Service concludes that the incidental take of southwestern willow flycatcher will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. More than one (1) acre of occupied habitat at any individual project site is impacted;
2. More than twenty (20) acres of occupied habitat are impacted by all projects covered during the fiver-year term of the PBO;
3. More than one (1) southwestern willow flycatcher adult is found dead or injured; or
4. More than one (1) southwestern willow flycatcher nest containing eggs or chicks is damaged or destroyed.

Tidewater Goby

The Service anticipates that take of the tidewater goby in the form of harm, injury, or mortality may occur as a result of implementing the proposed projects in and around tidewater goby habitat. Take will be difficult to detect due to the species cryptic coloring, life history, and ecology. The exact number of individuals taken will be difficult to quantify because tidewater goby population sizes fluctuate greatly seasonally and year-to-year, with the amount of occupied area varying with seasonal and stochastic events.

We anticipate that any individual project would not exceed 1 acre of tidewater goby occupied habitat. The Service is exempting take incidental to the proposed action in the form of harm

during capture and relocation or other project activities. We anticipate take in the form of death or injury of up to five percent of individuals captured and relocated at any individual project site. We do not anticipate that the proposed action will cause take of more than 5 percent of the estimated population at any individual occupied feature (i.e., estuary/lagoon).

Accordingly, the Service concludes that the incidental take of the tidewater goby will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. More than one (1) acre of occupied habitat at any individual project site is taken; or
2. Death or injury of more than five (5) percent of individuals captured and relocated at any individual project site.

Yellow-Billed Cuckoo

The Service anticipates that incidental take of the yellow-billed cuckoo associated with FEMA's proposed action may occur from habitat removal during the non-breeding season (affecting birds returning to impacted territories the following breeding season) or from project activities that occur during the breeding season that may displace adults and kill juveniles or eggs. We anticipate that any individual project would not exceed 1 acre of yellow-billed cuckoo habitat disturbance, within which a maximum of one pair of yellow-billed cuckoos may be impacted by being displaced from their territory and be subject to non-lethal harm. Due to the very low density of yellow-billed cuckoos within the action area, this is likely an overestimate of take that would occur. Temporary impacts from all projects covered under this consultation will be limited to a maximum of 20 acres of yellow-billed cuckoo occupied habitat, within which a maximum of 10 yellow-billed cuckoo pairs are estimated to be impacted.

The Service anticipates and is exempting take incidental to the proposed action in the form of non-lethal harm to a maximum of 10 yellow-billed cuckoos within 20 acres of habitat; and harm in the form of injury or death of no more than one adult yellow-billed cuckoos or one nest containing yellow-billed cuckoo eggs or chicks for the 5-year duration of this PBO.

Accordingly, the Service concludes that the incidental take of yellow-billed cuckoo will be considered exceeded if one or more of the following conditions are met. Under these circumstances, as provided in 50 CFR §402.16, reinitiation of formal consultation will be required.

1. More than one (1) acre of occupied habitat is impacted at any individual project site;
2. More than twenty (20) acres of yellow-billed cuckoo occupied habitat are impacted by all projects during the five-year term of the PBO;
3. More than one (1) yellow-billed cuckoo adult is found dead or injured; or
4. More than one (1) yellow-billed cuckoo nest containing eggs or chicks is damaged or destroyed.

EFFECT OF THE TAKE

In the accompanying PBO, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURE

The measure described below is non-discretionary, and must be undertaken by FEMA or made a binding condition of any grant or permit issued to the (Subapplicant), as appropriate, for the exemption in section 7(o)(2) to apply. FEMA has a continuing duty to regulate the activity covered by this incidental take statement. If FEMA (1) fails to assume and implement the terms and conditions or (2) fails to require the Subapplicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, FEMA or the Subapplicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.14(i)(3)].

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize the impacts of the incidental take of the 12 covered entities:

1. FEMA and their Subapplicants shall fully implement and adhere to all general and species-specific conservation measures, as described in the PBA and restated in the Conservation Measures section of this PBO. Additionally, FEMA and their Subapplicants will adhere to any landscape level plans developed by the VFWO for the species covered in this PBO.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the FEMA must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are nondiscretionary.

1. FEMA shall require that all personnel and Subapplicants associated with this project are made aware of the general and species-specific conservation measures that are applicable to their individual project and are aware of their responsibility to implement these measures fully.

2. FEMA Region IX shall attend an annual coordination meeting with the Service by May 15 each year to discuss the annual monitoring report and any adaptive management measures needed to minimize impacts, including the addition or removal of any conservation measures or inclusion of any landscape level strategies developed by the VFWO.

REPORTING REQUIREMENTS

Pursuant to 50 CFR 402.14(i)(3), FEMA must report the progress of the action and its impact on the species to the Service as specified in this incidental take statement. FEMA shall submit an annual report to the Service by March 15 summarizing all projects completed during the previous calendar year. These annual reports shall include a tabular summary of those projects and for each project:

1. Subapplicant and project name;
2. Project location with map or GIS shape file;
3. Covered species impacted;
4. Estimated acres of covered species' habitat affected (acres, linear feet, etc.), as stated in the ESA Review Form;
5. Any other pertinent information that allows the Service to evaluate the causes and extent of habitat effects and any incidental taking that may have occurred that was not authorized in the Incidental Take Statement of this PBO.
6. The annual report will also include a summary of acres of habitat taken and individuals injured or killed from all previous years.
7. FEMA shall require that the Subapplicant to provide a copy of the project report to the Service and FEMA with the following project-specific details on its respective projects within 45 days of project construction completion:
    a. Date the project was initiated and completed;
    b. Number of observed instances of injury or mortality of any covered species;
    c. Number of observations of live, uninjured individuals of any covered species;
    d. Pertinent information concerning the success of the project in meeting the conservation measures; and
    e. An explanation of failure to meet such measures, if any.

DISPOSITION OF DEAD OR INJURED SPECIMENS

As part of this incidental take statement and pursuant to 50 CFR 402.14(i)(1)(v), upon locating any dead or injured species covered in this PBO, initial notification within 24 hours of its finding must be made by telephone and in writing to the VFWO (805-644-1766). If the encounter occurs

after normal working hours, FEMA or its Subapplicants shall contact the VFWO at the earliest possible opportunity the next working day. The report must include the date, time, location of the carcass, a photograph, cause of death or injury, if known, and any other pertinent information.

Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as the VFWO-approved biologist. Dead individuals must be sealed in a resealable plastic bag containing a paper with the date and time when the animal was found, the location where it was found and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site, until the Service provides instructions regarding the disposition of the dead specimen.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. FEMA has included a meaningful Section 7(a)(1) component to this project and the Service recognizes FEMA's effort to design their program within the context of listed species conservation. The Service acknowledges the conservation measures in this PBO and comprehensive. Any additional information related to listed species helps Service biologists in their management. As such the Service recommends the following action:

- Sightings of any listed and sensitive species encountered during FEMA-funded activities should be reported to the CNDDB, California Department of Fish and Game.
- FEMA should work with the Service to implement proactive conservation measures for species of species concern such as the Monarch butterfly (*Danaus plexippus plexippus*).
- FEMA should continue to work with the VFWO to deliver conservation measures contained within this PBO through the Service's ECOS-IPaC platform.
- FEMA should continue to work with the service to develop additional 7(a)(1) actions to contribute towards trusted resources conservation.

The Service requests notification of the implementation of any conservation recommendations so we may be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats.

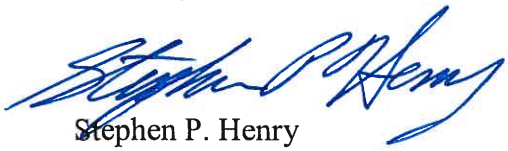
REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered

in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, the exemption issued pursuant to section 7(o)(2) may have lapsed and any further take could be a violation of section 4(d) or 9. Consequently, we recommend that any operations causing such take cease pending reinitiation.

If you have any questions about this biological opinion, please contact Jenny Marek of my staff at (808) 677-3313, or by electronic mail at jenny_marek@fws.gov.

Sincerely,



Stephen P. Henry
Field Supervisor

Appendix A

The U.S. Fish and Wildlife Service (Service) consulted on the Federal Emergency Management Agency's (FEMA) Disaster, Mitigation, and Preparedness Programs in California within the Ventura Fish and Wildlife Office (VFWO) and its effects on federally listed species and critical habitat, in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 et seq.). The Service provided a programmatic concurrence with FEMA's 'not likely to adversely affect' determination for six listed species and, if applicable, their critical habitat. The programmatic concurrence was based on the assumption that FEMA and its Subapplicants will implement a suite of conservation measures (see Appendix B) developed during extensive collaboration between FEMA and the Service. The measures were designed with species conservation in mind to reduce direct and indirect impacts on listed species to an insignificant and discountable level. If the measures in Appendix B are not able to be implemented for a specific project, FEMA will submit the project for separate section 7 consultation.

California Least Tern (*Sterna antillarum browni*) and Light-Footed Ridgway's Rail (*Rallus longirostris levipes*)

California least tern and light-footed Ridgway's rail could be affected by removal of habitat and direct impacts to nests, nestlings, and eggs. They could also be affected by noise that disrupts breeding, feeding, and predator avoidance. However, FEMA's action includes implementation of the species specific conservation measures listed in Appendix B. Specifically, the measures require project activities in habitat for these species will occur outside the season of use for these species, and ground disturbance will be restricted to hand tools. Thus, impacts will not occur to nest, nestlings, and eggs, and impacts to habitat will have an insignificant effect on California least tern and light-footed Ridgway's rail. Further, project activities during the season of use will occur 800 feet away from California least tern habitat and 500 feet away from light-footed Ridgway's rail habitat, and only hand tools will be used. These measures were designed, with extensive collaboration between the Service and FEMA, to reduce direct and indirect impacts to California least tern and light-footed Ridgway's rail to an insignificant and discountable level. Thus, the VFWO concurs with FEMA's not likely to adversely affect determination.

Contra Costa goldfields (*Lasthenia conjugens*)

Contra Costa goldfields is a vernal pool plant species with previous known occurrences in Santa Barbara and Monterrey counties. Recent wildfires have impacted the status of the species such that we are not currently aware of any known occurrences. This species could be affected by crushing, trampling, or removal of individual plants. Additionally, the species could be impacted by changes in hydrology, introduction of pesticides, or invasive plants into the vernal pool system. However, FEMA's action includes implementation of the species specific conservation measures listed in Appendix B. Specifically, the measures require pre-activity surveys, buffers, erosion control measures, and precautions against invasive species. These measures were designed, with extensive collaboration between the Service and FEMA, to reduce direct and indirect impacts to Contra Costa goldfields to an insignificant and discountable level. Thus, the VFWO concurs with FEMA's not likely to adversely affect determination.

Marbled murrelet (*Brachyramphus marmoratus*)

A small amount of terrestrial habitat for marbled murrelets occurs within the action area. Marbled murrelets could be affected by removal of habitat and direct impacts to nests, nestlings, and eggs. They could also be affected by noise that disrupts breeding, feeding, and predator avoidance. However, FEMA's action includes implementation of the species specific conservation measures listed in Appendix B. Specifically, the measures include restrictions on removal of vegetation, and parameters on activities that may cause disturbance. These measures were designed, with extensive collaboration between the Service and FEMA, to reduce direct and indirect impacts to Marbled murrelet to an insignificant and discountable level. Thus, the VFWO concurs with FEMA's not likely to adversely affect determination.

Riverside Fairy Shrimp (*Streptocephalus woottoni*)

The only known location occurrences of Riverside fairy shrimp within the VFWO's jurisdiction, occur within Designated Critical Habitat Unit (CHU) 1a and 1b. These two CHUs are critically vital to the species' conservation within our jurisdiction. However, FEMA's action includes implementation of the species specific conservation measures listed in Appendix B. Specifically, the measures exclude projects that have any adverse effects to CHU 1a and 1b and also prevent impacts to the actual basin/inundation features in any suitable Riverside fairy shrimp habitat. These measures were designed, with extensive collaboration between the Service and FEMA, to reduce direct and indirect impacts to Riverside fairy shrimp to an insignificant and discountable level. Thus, the VFWO concurs with FEMA's not likely to adversely affect determination.

Western Snowy Plover (*Charadrius nivosus* ssp*. Nivosus*)

Western snowy plover could be affected by removal or modification of habitat and direct impacts to nests, nestlings, and eggs. They could also be affected by noise that disrupts breeding, feeding, and predator avoidance. However, FEMA's action includes implementation of the species specific conservation measures listed in Appendix B. Specifically, the measures require project activities in habitat for these species to be restricted to hand tools, and temporary impacts to be restored. Thus, impacts due to habitat loss will be insignificant. Also, a biological monitor will be used to ensure that impacts to breeding western snowy plovers are avoided. Human activities and use of hand tools during the non-breeding season may result in minor disturbance or displacement of overwintering birds, but these activities are not anticipated to substantially impact western snowy plover survival or reproduction. These measures were designed, with extensive collaboration between the Service and FEMA, to reduce direct and indirect impacts to Western snowy plover to an insignificant and discountable level. Thus, the VFWO concurs with FEMA's not likely to adversely affect determination.

Appendix B

The U.S. Fish and Wildlife Service (Service) consulted on the Federal Emergency Management Agency's (FEMA) Disaster, Mitigation, and Preparedness Programs in California within the jurisdiction of the Ventura Fish and Wildlife Office (VFWO) and its effects on federally listed species and critical habitat, in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 et seq.). FEMA provided these conservation measures as part of the programmatic biological assessment[1] (PBA) for the programmatic consultation. Implementation of the following conservation measures is required in order for any specific project activity to be considered under the programmatic concurrence provided in the accompanying document. For any actions where FEMA or its Subapplicants are unable to implement the following measures, FEMA must submit the project for separate section 7 consultation as the effects to listed species or their designated critical habitat outside the scope of these conservation measures have not been assessed or analyzed.

Conservation Measures for California Least Tern (*Sterna antillarum browni*) and Light-Footed Ridgway's Rail (*Rallus longirostris levipes*)

1. To avoid the nesting season of the California least tern, project activity in occupied habitat will be allowed from September 30 - March 31. Occupied habitat for this species is well documented online. If project activities occur during the nesting season, they will occur at least 800 feet away from California least tern occupied habitat, and noise within occupied habitat will be monitored to ensure that it does not exceed 60 decibels hourly Leq.
2. A habitat assessment will be conducted by a biologist to determine whether suitable habitat (including foraging, nesting, and dispersal) for the light-footed Ridway's rail occurs in the Action Area. If suitable habitat for this species is identified in the Action Area and the proposed project may affect suitable habitat that is not known to be occupied by the light-footed Ridway's rail, the VFWO will be contacted regarding the need for additional surveys and those surveys will be conducted, as appropriate. Otherwise, if the VFWO agrees, the species will be assumed to be present in areas with suitable habitat.
3. To avoid the nesting season of the light-footed Ridway's rail, project activity in occupied habitat will be allowed from September 16 - March 14. If project activities occur during the nesting season, they will occur at least 500 feet away from light-footed Ridgway's rail occupied habitat, and noise within occupied habitat will be monitored to ensure that it does not exceed 60 decibels hourly Leq.
4. A Service-approved biologist will monitor all construction activities within occupied habitat to ensure that no take of the species or destruction of occupied habitat occurs. The Service-approved biologist will have stop work authority if adverse effects of nesting California least terns or light-footed Ridgway's rails are observed.
5. Non-breeding season project activity in occupied habitat will be limited to the use of handheld tools, including handheld motorized implements such as chain saws and power

[1] The measures in the PBA are part of a state-wide consultation. The measures were created by different Service offices in collaboration with FEMA. For consistency with the state-wide programmatic, we have kept the numbering system reflective of the PBA even though it is not consistent within this appendix.

augers. Tools will be washed prior to use in these habitats to reduce the potential for spread of non-native and invasive plant species and their seeds. No heavy equipment will be allowed within suitable nesting habitats.

6. No soil stabilization materials or off-site materials (e.g., decomposed granite, soil, rocks, etc.) will be added to the surface within occupied habitat. No excavation or grading would be allowed within occupied habitat either.
7. If handheld motorized tools are used, operators will employ best management practices to avoid and minimize soil and water contamination from fuel and lubricants. Measures include:
    a. use spill-resistant fuel and lubricant containers;
    b. use a portable containment pad for re-fueling in the field;
    c. immediately report petroleum spills to the landowner, or land management agency, and notify appropriate local authorities for advice and action on containment and cleanup of spills; and
    d. clearly mark the location and/or boundaries of the spill site to enable rapid remedial action.
8. 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.
9. 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 within occupied habitat.
10. Access to work sites in occupied habitat will be by foot travel only. Motorized vehicles, including all-terrain vehicles, will not be used in occupied habitat.
11. At the conclusion of the project, areas temporarily affected by project activity will be restored to their pre-project condition (e.g. footpaths will be raked to their original ground contour and native vegetation will be reestablished, if necessary).
12. Trash, food, food containers, and food waste will be secured at all times by individual workers, or placed in animal-proof trash containers placed at the work site. The contents of trash containers will be transferred from the work site at the end of each day.
13. Project activities will avoid creation of berms and dykes, steepening of channel slopes, placement of rock slope protection, and other actions that could result in alteration of hydrology, changes to water surface elevation levels, increased flooding, changes to flow velocities, and increased scour within light-footed Ridgway's rail occupied habitat.

Conservation Measures for Contra Costa goldfields (*Lasthenia conjugens*)

To avoid and minimize potential adverse effects to the vernal pool plants, the measures listed below will be implemented in the project footprint where suitable listed branchiopod habitat (e.g., vernal pools, seasonal wetlands) occurs and the species have potential to occur.

Vernal Pools

1. If possible, prior to construction activities, the Service-approved biologist will conduct protocol-level bloom-season plant surveys in seasonally inundated habitats (seasonal wetland, non-inundated wetlands) within the project footprint. If any listed vernal pool plant species are found during the surveys, the Service-approved biologist will submit a

report to the Service within 1 month of completing the field work. The report will provide results of all surveys, a summary of all the data collected, and the habitat assessment. Information regarding the location of listed plant populations will be provided to CDFW's California Natural Diversity Database (CNNDB) according to their reporting protocols. If surveys are not possible, then listed vernal pool species presence will be assumed on all suitable habitats within the Action Area.

2. Flagging or other field markers identifying the plants, or in the event 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.
3. A Service-approved biologist will monitor all construction activities within 250 feet of suitable habitat for listed vernal pool plants to ensure that no unnecessary loss or destruction of habitat occurs.
4. A Service-approved biologist will delineate a 50-foot avoidance buffer around all listed plants or their suitable habitat. The non-disturbance exclusion zones will be established, maintained and monitored by a Service approved biological monitor to ensure that loss of listed vernal pool plants or destruction of their habitat does not occur outside of the project footprint where suitable habitat (e.g., vernal pools, seasonal wetlands) occurs and the species have potential to occur.
5. Work within 250 feet of suitable listed 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.
6. A Service-approved project biologist will flag or monitor all operations and maintenance work during the *dry season* (generally June 1 to October 15) within 250 feet of a vernal pool, vernal pool grassland, or seasonal wetland. The following buffers will be enforced:
    a. Hand-held herbicide application is prohibited within the pool or at the edge of the pool;
    b. Power spray herbicide application is prohibited within 100 feet of the edge of the pool;
    c. Broadcast herbicide application is prohibited within 150 feet of the edge of the pool; and
    d. Ground-disturbing activities are prohibited within 25 feet of the edge of the pool.
7. If any construction activities remain and must occur during the October 15 - June 1 *wet period*, exclusion fencing and erosion control materials will be placed around the vernal pools and other seasonal wetlands as determined by the Service-approved 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 Service approved biologist will erect and maintain the exclusion fencing.
8. Any vernal pool, vernal pool grassland, or seasonal wetland will be protected from siltation and contaminant runoff by use of erosion control.
9. Erosion-control materials will be of a tightly woven natural fiber netting or similar material that will not entrap reptiles and amphibians (e.g., coconut coir matting). No micro-filament netting will be used.
10. Erosion-control measures will be placed between the outer edge of the buffer and the activity area. All fiber rolls and hay bales used for erosion control will be certified as free of noxious weed seed.

11. 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-storm water discharge.
12. A Service-approved biologist will flag or monitor all operations and maintenance work during the *wet season* (generally October 1 to June 1) within 150 feet of a vernal pool, vernal pool grassland, or seasonal wetland. The following buffers will be enforced:
    a. Hand-held herbicide application is prohibited within 25 feet of the edge of the pool;
    b. Power spray herbicide application is prohibited within 100 feet of the edge of the pool;
    c. Broadcast herbicide application is prohibited within 150 feet of the edge of the pool;
    d. Manual clearing of vegetation is prohibited at the pool or beyond the edge;
    e. Mechanical clearing of vegetation is prohibited within 100 feet of the edge of the pool; and
    f. Ground-disturbing activities are prohibited within 50 feet of the edge of the pool.
13. A buffer of at least 300 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; and
    b. Mixing of pesticides, herbicides, or other potentially toxic chemicals.
14. Vehicles will be inspected daily for fluid leaks before leaving a staging area.
15. Routine maintenance activities within 250 feet of vernal pool and swale habitat will be avoided to the maximum extent possible.
16. When restoring upland areas to pre-project condition, native plants will be used to the maximum extent practicable.
17. To minimize the introduction of invasive plant species, construction vehicles will be cleaned prior to entering any vernal pool habitat.

Conservation Measures for Marbled murrelet (*Brachyramphus marmoratus*)

(a) Occupied Habitat

If marbled murrelet surveys (using the Service 2003 survey protocol; Evans Mack *et al.* 2003) determine[2] that the Action Area is occupied **or** if FEMA or the Service presumes marbled murrelet occupancy without conducting surveys, the project Subapplicant will adhere to the following Conservation Measures:

i. Vegetation Removal or Alteration of Known or Potential Nest Trees:
    a. No potential marbled murrelet nest trees[3] will be removed during the nesting season (March 24 to September 15).

[2] Surveyors are required to meet or exceed all training recommendations in Evans Mack et al. (2003), and be registered as qualified surveyors on a current Service 10(a)1(b) Recovery Permit.

[3] Potential habitat defined by Nelson et al. (2003) as: (1) mature (with or without an oldgrowth component) and old-growth coniferous forests; and (2) younger coniferous forests that have platforms (relatively flat, at least 4-inch diameter and at least 33 feet above the base of the live crown of a coniferous tree). Platform presence is more important that tree size.

b. Avoid removing or damaging known or potential nest trees, unless they are a confirmed safety hazard. 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.
c. Avoid removing or damaging trees with potential nesting platforms. A platform is a relatively flat surface at least 10 centimeters (4 inches) in diameter and 10 meters (33 feet) in height 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.
d. Project activities will not remove the function of suitable nesting habitat.
    - While habitat elements may be removed, such as individual large trees if they are a confirmed safety hazard, from nesting habitat, the treatment must not be so extensive as to remove the overall function of the nesting habitat, and will be conducted outside of the nesting season.
e. Non-suitable nest trees or limb trimming or pruning, brush trimming or removal, and hazard tree felling within suitable habitat may occur outside of the nesting season, September 16 to March 23.

ii. Auditory, Visual, or Other Disturbance:

a. Construction equipment must be in good working order, with emphasis on hydraulic and noise abatement systems. Hydraulic leakage and damaged mufflers (or spark arresters) must be promptly addressed and remedied to the degree practicable.
b. 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 within suitable marbled murrelet nesting habitat during the majority of the murrelet nesting season (*i.e.*, March 24 to August 5)
c. Between August 6 (date when most marbled murrelets have fledged in coastal northern California) and September 15 (end of marbled murrelet nesting season) of any year, project activities, with adjacent suitable nesting habitat, that will generate sound levels greater than or equal to 10 decibels 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 the Service guidelines (Service 2006). 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.
d. No human activities will occur within visual line-of-sight of 40 meters (131 feet) or less from a known nest or suitable nest tree during the nesting season (March 24 to September 15) (Service 2006).

(b) Unoccupied Habitat

(i) If recent protocol surveys determine that all suitable marbled murrelet nesting habitat within the Action Area is considered unoccupied, the auditory, visual, and other disturbance measures listed above under iii) do not apply for habitat determined to be unoccupied.

(c) Marbled Murrelet Critical Habitat

(i) Ensure that there are no "adverse effects" to designated critical habitat for marbled murre+let within the Action Area. However, the Service has no specific quantitative thresholds, above which there would likely be an adverse effect to critical habitat. If a Subapplicant's proposed project encounters this situation, contact the Service to determine whether proposed habitat removal within designated critical habitat would constitute an adverse effect. Generally, the removal of a few small trees in unoccupied habitat would not result in adverse effect" on designated critical habitat.

(ii) When working in designated critical habitat for marbled murrelet, all measures described in Items (a) Occupied Habitat, or (b) Unoccupied Habitat for reducing impacts in suitable habitat will also be implemented. This will help reduce effects, and may result in some instances in effects that are insignificant and discountable.

Literature Cited

Evans Mack, D., W. P. Ritchie, S. K. Nelson, E. Kuo-Harrison, P. Harrison, and T. E. Hamer 2003. Methods for surveying Marbled Murrelets in forests: a revised protocol for land management and research. Pacific Seabird Group unpublished document available at: http://www.pacificseabirdgroup.org.

Service 2006. Estimating the effects of auditory and visual disturbance to northern spotted owls and marbled murrelets in northwestern California. Available at: http://www.fws.gov/arcata/es/birds/NSO/ns_owl.html.

Conservation Measures for Western Snowy Plover

The following avoidance and minimization measures apply to Action Areas within suitable snowy plover nesting habitat and designated critical habitat regardless of whether snowy plovers have been detected during Service approved protocol surveys.

(a) Project construction activities in suitable nesting habitat will occur during the species non-breeding season: the period beginning October 1 and continuing through February 28 of the following year; or through February 29 in a leap year.

(b) Project construction activities in suitable nesting habitat will be limited to the use of handheld tools including handheld motorized implements such as chain saws and power augers. No heavy equipment will be allowed within suitable nesting habitat.

(c) If handheld motorized implements are used, operators will employ best management practices to avoid and minimize soil and water contamination from fuel and lubricants. Measures include:

1. Use spill-resistant fuel and lubricant containers;
2. Consider the use of a portable containment pad for re-fueling in the field;
3. Immediately report petroleum spills to the landowner, or land management agency, and notify appropriate local authorities for advice and action on containment and cleanup of spills; and
4. Clearly mark the location and/or boundaries of the spill site to enable rapid remedial action.

(d) If project construction activities occur in adjacent to, but not within suitable nesting habitat, then project activities should be conducted during the species non-breeding season, if possible. If nonbreeding season construction is not possible, then the Subapplicant will employ a Service-approved biologist to conduct weekly western snowy plover surveys. If western snowy plovers are observed, the Service-approved biologist will notify the Service within 1 day of the observation and will monitor all construction activities conducted adjacent to western snowy plovers suitable nesting habitat. The qualified biologist will have the right and responsibility to stop work if adverse effects of nesting western snowy plovers are observed.

(e) When necessary to minimize the area affected by the project, the Subapplicant or their contractors will mark the work site boundaries with flagging or other visible materials, and remove those markers at the conclusion of the project.

(f) 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.

(g) Access to work sites will be by foot travel only. Motorized vehicles, including all-terrain vehicles, are not permitted on work sites located within suitable nesting habitat.

(h) Vehicles used for transport of personnel will be restricted to existing parking lots or roadside parking areas.

(i) At the conclusion of the project, areas temporarily impacted by project activity will be restored to their pre-project condition (for example, footpaths are to be raked to their original ground contour and cut vegetation is to be removed or piled for future disposal).

(j) Trash, food, food containers, and food waste will be secured at all times by individual workers, or placed in animal-proof trash containers placed at the work site. The contents of trash containers will be transferred from the work site at the end of each day.

(k) Pets will be prohibited from all work sites.

Conservation measures for Riverside fairy shrimp

The following conservation measures apply to any suitable Riverside fairy shrimp habitat within the VFWO's jurisdiction. For the purposes of this PBO, suitable fairy shrimp habitat includes the basin/inundation feature where fairy shrimp and/or resting eggs would be found, and the area of the watershed needed to support the feature(s).

1. Prior to any site disturbance (e.g., vegetation removal, soil disturbance) in suitable fairy shrimp habitat or initiation of construction activities, a VFWO-approved biologist with demonstrable experience with the diversity of habitat types in which listed branchiopod species can occur will conduct a habitat assessment survey. The intent of this survey is to provide information regarding the likelihood that potential habitat for one or more of the three listed branchiopod species is present within, or immediately adjacent to, the project footprint. As part of this assessment, if inundated features are present, their quality and

suitability for occupation by one or more of these species will be included. If, based on the results of the habitat assessment, species presence is likely, FEMA or the project applicant will contact the Ventura Fish and Wildlife Office (VFWO) regarding the need for surveys according to current Service guidance. Modification to this guidance may be allowed if pre-approved by the VFWO. If it is not feasible to conduct surveys, the species presence will be assumed for all suitable habitat in the project area.

2. Any projects that have the potential to result in adverse effects to Critical habitat units 1a and 1b designated for Riverside fairy shrimp in Ventura County are not included in this concurrence and will require separate consultation.
3. Impacts to basin/inundation areas known or presumed occupied by one or more of the species and likely to contain resting eggs will be avoided.
4. Impacts to watershed areas that support occupied or presumed occupied basin/inundation features will be avoided to the maximum extent possible. If avoidance is not possible, the following measures will be implemented as applicable.
5. Disturbance exclusion zones will be established, maintained, and monitored by a VFWO-approved biologist to ensure that impacts to basin/inundation features watershed, and/or critical habitat do not extend beyond the identified project footprint.
6. A VFWO-approved biologist will monitor all site preparation (e.g., soil disturbance, vegetation removal) and/or construction activities within 250 feet of fairy shrimp habitat to ensure that there are no impacts to either inundation feature/basin. No permanent impacts to fairy shrimp habitat will occur. Actions that result in permanent alteration of the hydrology that supports inundation/basin features (e.g., construction of culverts, v-ditches, berms, roads, will could divert flows) must be avoided as they have not been analyzed and are not addressed in this programmatic consultation.
7. All equipment storage, fueling, cleaning, maintenance, and mixing of pesticides, herbicides, or other potentially toxic chemicals is restricted to an area at least 300 feet from any basin/inundation features. Hazardous material absorbent pads must be present onsite and made easily accessible in the event of a spill.
8. To the maximum extent possible, site preparation and construction activities will be restricted to the dry season (generally considered to be between June 1 and October 15) and occur only under conditions when soil is dry to the touch at the surface and to a depth of 2.5 cm (1 in.). The Service may approve modifications to this timing on a case-by-case basis. The following measures will be established and enforced:
   (a) There will be no soil disturbing activities or herbicide application in a basin/inundation feature or within 25 feet of such a feature;
   (b) There will be no held herbicide application within 50 feet of a basin/inundation feature;
   (c) There will be no power spray herbicide application within 100 feet of a basin/inundation feature; and
   (d) There will be no broadcast herbicide application within 150 feet of a basin/inundation feature.
9. If it is not possible to restrict site preparation and/or construction activities to the dry season, the following measures will be established and enforced:
   (a) A VFWO-approved biologist will monitor all site preparation, construction, and/or maintenance activities to occur within 150 feet of a basin/inundation feature.

(b) Exclusion fencing and erosion control materials will be installed under the supervision of a VFWO-approved biologist to prevent the discharge of sediment into basin/inundation features
(c) There will be no soil disturbing activities or manual clearing of vegetation in or within 50 feet of a basin/inundation feature;
(d) There will be no mechanical clearing of vegetation within 100 feet of a basin/inundation feature;
(e) There will be no hand-held herbicide application within 25 feet of the edge of a basin/inundation feature; and
(f) There will be no power spray or broadcast herbicide application within 150 feet of a basin/inundation feature.

10. The following practices will be implemented within or immediately adjacent to fairy shrimp habitat:
    (a) Implementation of erosion control measures that will protect basin/inundation features from siltation and contaminant runoff. Erosion-control materials will be composed of a tightly woven natural fiber netting or similar material that will not entrap other wildlife species.
    (b) Erosion control materials cannot be comprised of plastic or microfilament netting and all fiber rolls and hay bales used for erosion control must be certified as free of noxious weed seed.
    (c) There will be no application of water (e.g., for dust suppression) within 100 feet of a basin/inundation feature without the use of additional protective measures (e.g., barriers and/or use of low flow water truck nozzles) to keep this type of water out of these features.
    (d) All refueling, maintenance, and staging of equipment and vehicles is restricted to those areas specifically designed to contain any spills. These activities will not occur in any location where spill materials could drain towards a basin/inundation feature.
    (e) Vehicles will be inspected daily for fluid leaks before leaving a staging area.
11. The VFWO-approved biologist will ensure that the spread or introduction of invasive nonnative plant species, via introduction by arriving vehicles, equipment, imported gravel, and other materials, is avoided to the maximum extent possible. Construction vehicles will be certified clean prior to any work within 150 feet of fairy shrimp habitat to minimize the introduction of invasive nonnative plant species, As practicable, nonnative plant species present within the project area will be removed from the site. Disposal will be in a manner that will not promote their spread to other areas. Invasive nonnative species are those identified in the California Invasive Plant Council's (Cal-IPC) Inventory Database, accessible at: www.cal-ipc.org/ip/inventory/index.php.
12. Restoration of temporary impacts to topography and vegetation will occur in accordance with a restoration plan reviewed and approved by the VFWO prior to the initiation of project activities. Plant species used in revegetation efforts will consist of native species suitable for the area. Locally collected plant materials will be used to the extent practicable.

Appendix C

ESA Review Form for Projects Under FEMA's PBA with USFWS in California in the Sacramento, Ventura, or Carlsbad FWO Jurisdictions (to be submitted to USFWS)

INSTRUCTIONS: This Endangered Species Act (ESA) Review Form is for proposed projects that may be funded under various FEMA grants programs in California and that would be covered under FEMA's Programmatic Biological Assessment (PBA) and the corresponding U.S. Fish and Wildlife Service (USFWS) Programmatic Biological Opinions (PBOs) from the Sacramento, Ventura, and Carlsbad Fish and Wildlife Offices (FWOs). This form must be filled out by a qualified Biologist[1] who is knowledgeable on the ESA, federally listed species[2] and their habitats, and Critical Habitat[3]. This form provides the information necessary for FEMA to make a determination of effects from the Subapplicant's proposed project for compliance with the ESA regarding federally listed species and their Critical Habitats. For subapplicant's proposed projects that meet the criteria for coverage under the PBA-PBOs, FEMA would submit this completed form to the USFWS and request coverage under the one of the PBA-PBOs from the applicable FWO. There are four sections in this form (check the sections being submitted):

- ☐ **Section A:** Information on the proposed project,
- ☐ **Section B:** Determination of effects to federally listed species and/or Critical Habitat protected under the ESA,
- ☐ **Section C:** ESA Review for Not Likely to Adversely Affect (NLAA) determinations for proposed projects under the applicable FEMA PBA-PBO, and
- ☐ **Section D:** ESA Review for Likely to Adversely Affect (LAA) determinations for proposed projects under the applicable FEMA PBA-PBO.
- ☐ **Section E:** For USFWS to complete and sign.

Please complete **Sections A** and **B**, and complete either **Section C** or **D** of the form, as needed. Use the highest level of the ESA determination to select whether to complete Section C or D of this form. If there is an LAA determination for at least one federally listed species and/or Critical Habitat, please complete Section D only and address the other species in that section as well. Attach photographs, relevant maps, preliminary engineering designs, and any additional information on the Subapplicant's proposed project. After completing the applicable sections of this form, please fill out the Summary Table below:

[1] A qualified Biologist consists of an environmental professional with at least a Bachelor's degree in Biology, Ecology, Natural Resources, Environmental Sciences, or similar, and has significant experience over multiple years working with federally listed species, their habitats, and Endangered Species Act implementation in the State of California.

[2] In this form, the term "federally listed species" includes species listed or proposed to be listed as threatened or endangered under Endangered Species Act.

[3] In this form, the term "Critical Habitat" refers to designated Critical Habitat and proposed Critical Habitat for federally listed species protected under the Endangered Species Act.

Summary Table Summary of ESA Effects Determination on Federally Listed Species and Critical Habitat			
FEMA Grant # or Disaster # and Project Worksheet # and Site/LOP #	**Species Name**	**ESA Effects Determination**	**Critical Habitat**
	Species 1 (common and scientific name)	Choose between: • No effect • May affect, but is not likely to adversely affect • May affect, and is likely to adversely affect	Choose between: • No effect • May affect, but is not likely to adversely affect critical habitat • May affect, and is likely to adversely affect critical habitat (i.e., physical and biological features)
	Species 2 (common and scientific name)	Choose between: • No effect • May affect, but is not likely to adversely affect • May affect, and is likely to adversely affect	Choose between: • No effect • May affect, but is not likely to adversely affect critical habitat • May affect, and is likely to adversely affect critical habitat (i.e., physical and biological features)
	Species 3 (common and scientific name)	Choose between: • No effect • May affect, but is not likely to adversely affect • May affect, and is likely to adversely affect	Choose between: • No effect • May affect, but is not likely to adversely affect critical habitat • May affect, and is likely to adversely affect critical habitat (i.e., physical and biological features)

Note: If the Subapplicant's proposed project is under another Federal agency's jurisdiction (e.g., U.S. Forest Service, National Park Service, Bureau of Land Management, Bureau of Reclamation, etc.) or another Federal agency is functioning as the Lead Federal Agency (e.g., U.S. Army Corps of Engineers), then there no need to prepare this FEMA form.

Name of Qualified Biologist and Date of Preparation: **Biologist's Qualifications:** **Professional Degree:** **Years of experience working with federally listed species, their habitats, and Endangered Species Act implementation in the State of California:**
SECTION A. INFORMATION ON PROPOSED PROJECT (press F11 to advance to the next field)
A.1. Project Name:
A.2. FEMA Grant # or Disaster and Project Worksheet #s:
A.3. Name of Subapplicant (Agency Name)[4]:
A.4. Project Location (street address, latitude/longitude, or UTM and Datum/Zone):
A.5. State/County/Municipality:
A.6. Description of the Action Area[5]: **Please attach a map(s), aerial image, photographs, GIS data layers, and other information on the Action Area. Please include a description of the vegetation communities, aquatic habitats, slope, ambient noise levels, and any sensitive biological resources in the Action Area.** **Briefly describe the project footprint[6] in a few sentences below:**

[4] In the case of a Tribe, the term to be used is "Applicant".

[5] Action Area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR §402.02).

[6] Project footprint corresponds to all the areas with structures affected by implementation of the Subapplicant's proposed project, including construction staging areas, spoils disposal sites, gravel or rock pits, access routes, any areas of ground disturbance, etc.

Are any water bodies including rivers, streams, seasonal wetlands (i.e., vernal pools, ponds, wet meadows, etc.), estuaries, or coastal water bodies located within the Action Area?
☐ **YES** ☐ **NO**

If Yes, will in-water work be needed for completion of the Subapplicant's proposed project?
☐ **YES** ☐ **NO**

If No, how far is the water body from the limits of ground disturbance and/or vegetation removal?

What is the name of the river, stream, estuary, or coastal water body? If the river/stream is a tributary, provide the name of the receiving water body. For seasonal/annual bodies of water, describe the time of year and the duration of time that water is typically present. Describe the flow of water (i.e., still, slow moving, swift, etc.) anticipated during the scheduled activities for the proposed project.

A.7. Proposed Project Schedule and Duration:
Please provide start and end dates (including month and year) of project implementation, number of work days, and number of work hours per day (e.g., 5 days of work for 10 hours per day).

Start Date **End Date**

Number of work days:

Number of work hours per day:

Will any work activities occur during nighttime? If so, please describe them.

A.8. Description of Subapplicant's Proposed Project:
Describe the project activities in detail, including construction methods (i.e., equipment to be used, access routes, construction work areas, construction staging areas, spoils disposal sites, gravel or rock pits, etc). Include the Subapplicant's best management practices[7] to be implemented, and post-construction activities, if applicable. (The details described here are as provided by the Subapplicant in their project description.) Attach project plans and layouts and post-project monitoring and reporting plans, if available.

Select the applicable project type(s):

☐ **Non-Emergency Debris Removal**
☐ **Road and Trail Construction**
☐ **Utility Construction**
☐ **Rail Line Construction**
☐ **Flood Control Activities**
☐ **Culvert Construction**
☐ **Bridge Construction**
☐ **Airport Runway Construction**
☐ **Facility Disaster Mitigation Activities**
☐ **Building and Facility Construction**
☐ **Channelization**
☐ **Stormwater Management**
☐ **Dam Construction**
☐ **Bank Protection, Stabilization, and Erosion Control Activities**
☐ **Detention/Retention, or Basin Water Storage Facility Construction**
☐ **Linear Water Conveyance Facility Construction**
☐ **Shoreline Facilities - Recreational or Maritime Use**
☐ **Shoreline Facilities - Protection**
☐ **Wildfire Risk reduction - Defensible Space Creation and Hazardous Fuels Reduction**

Describe the access routes:

[7] In this form, BMPs refer to standard measures proposed by the subapplicant as part of their proposed project. BMPs should not be confused with the Conservation Measures included in FEMA's PBA and the corresponding USFWS PBO.

Describe the construction staging and work areas:

If the Subapplicant's proposed project includes vegetation removal and/or trimming, describe the vegetation type and the extent that would be removed and/or trimmed. Describe the planned revegetation efforts, which should be consistent with the measures described in the applicable PBA-PBO.

SECTION B. DETERMINATION OF EFFECTS TO FEDERALLY LISTED SPECIES AND/OR CRITICAL HABITAT PROTECTED UNDER ESA

B.1. Does the Action Area for the Subapplicant's proposed project have the potential to support federally listed species and/or does it contain Critical Habitat including physical or biological features essential for the conservation of the species? Also, describe the methods and results of any listed species surveys and/or habitat assessments conducted.

Surveys/Habitat Assessment:

☐ **NO**

It has been determined that the Action Area occurs either:

- ☐ **a) Outside the range of any federally listed species,**
- ☐ **b) Within the range of a federally listed species but outside of occupied or suitable habitat and outside Critical Habitat, or**
- ☐ **c) Within Critical Habitat designation but lacks the physical or biological features essential for the conservation of the species.**

Go to B.2.

☐ **YES. List the federally listed species and Critical Habitat that is present or potentially present in the Action Area of the Subapplicant's proposed project (go to B.2)**

B.2. Could the Subapplicant's proposed project directly or indirectly affect federally listed species and/or Critical Habitat (i.e., the physical or biological features essential for the conservation of the species) in the Action Area?

☐ **NO**

No Effect. FEMA has determined that implementation of the proposed project would not affect federally listed species and/or Critical Habitat. If a No Effect determination has been made for the proposed project, do not complete Section C (for NLAA determinations only), nor Section D (for LAA determinations only). No notification to FEMA is required.
No consultation with the USFWS is required under the ESA.

☐ **YES (go to B.3)**

B.3. Can the Subapplicant incorporate the general *Avoidance and Minimization Measures* and the species-specific *Conservation Measures* listed in the applicable FEMA PBA-PBO into the proposed project to avoid or minimize effects on federally listed species (including avoiding take[8] as defined under ESA) and/or their Critical Habitat to levels that are <u>insignificant, discountable, or wholly beneficial</u>?

☐ **YES**

FEMA has determined that the proposed project May Affect, but is <u>Not Likely to Adversely Affect (NLAA)</u> federally listed species and/or their Critical Habitat. Direct and indirect effects would be insignificant, discountable or wholly beneficial. There are no adverse effects to species or their Critical Habitat. As such, take of individual(s) or destruction/adverse modification to Critical Habitat will not occur. Complete <u>Section C</u> of this form for NLAA determinations. FEMA will notify the USFWS by submitting the completed ESA Review Form for the proposed project and request that the proposed project be covered under the applicable FEMA PBA-PBO as an NLAA project.

☐ **NO**

FEMA has determined that the proposed project is <u>Likely to Adversely Affect (LAA)</u> <u>at least one</u> federally listed species and/or their Critical Habitat. Adverse effects to <u>at least one</u> federally listed species or <u>at least one</u> physical or biological feature of Critical Habitat may occur to reach an LAA determination. Complete the relevant portions of <u>Section D</u> of this form for LAA determinations. FEMA will notify the USFWS by submitting the completed ESA Review Form for the proposed project which may request coverage under the Incidental Take Statement (ITS) already included in the USFWS PBO issued to FEMA, if applicable.

SECTION C. ESA REVIEW FOR NLAA DETERMINATIONS FOR PROPOSED PROJECTS UNDER THE APPLICABLE FEMA PBA-PBO

C.1. Briefly describe the species potential to occur onsite (including closest CNDDB occurrences, suitable habitat, etc.) and the potential direct and indirect effects from implementation of the Subapplicant's proposed project in the Action Area. Refer to the applicable FEMA PBA-PBO for a description of potential effects, and describe <u>additional effects</u> as applicable.

a. **Direct and Indirect Effects on Federally Listed Species**

b. **Direct and Indirect Effects on Critical Habitat (including effects on specific Physical and Biological Features[9])**

C.2. Please list all the general *Avoidance and Minimization Measures* and the species-specific *Conservation Measures* that are applicable from the FEMA PBA-PBO, and indicate which will be implemented and why implementation of others is not necessary for the Subapplicant's proposed project to avoid and minimize direct and indirect effects, and briefly note how they would reduce those effects within the Action Area on the following:

a. **Federally Listed Species**

b. **Critical Habitat**

[8] Take: Under the ESA "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct [ESA §3(19)].

[9] Per 81 *FR* 7414, the physical or biological features refer to the features that are present that are essential to the conservation of the species and may require special management considerations or protection, which were formerly referred to as "Primary Constituent Elements."

Note: Please note that take (as defined under the ESA) of federally listed species is not allowed under the NLAA determination. If take of a federally listed species is reasonably certain to occur, then please fill out Section D for LAA determinations instead of this one.

C.3. Are there any interrelated[10] and/or interdependent[11] actions associated with the Subapplicant's proposed project? If so, please describe them.

C.4. Are there any other FEMA funded projects occurring within 1 mile of the Subapplicant's proposed project? If so, please list the disaster number (DR), Project Worksheet (PW), project name, and distance to this proposed project.

C.5. Summary of FEMA's NLAA Determination for Federally Listed Species and Critical Habitat from implementation of the Subapplicant's proposed project to demonstrate that the subapplicant's proposed project will have insignificant, discountable, or wholly beneficial effects to federally listed species or their Critical Habitat. List all the federally listed species and/or Critical Habitat covered under this NLAA determination. An ESA determination for each federally listed species and/or Critical Habitat is required.

Species: (common name)
Determination Rationale for Species: This project may affect, but is not likely to adversely affect the XX because of XXX (briefly summarize supporting rationale, application of AMMs, timing of actions, etc.).
Determination Rationale for Critical Habitat: This project may affect, but is not likely to adversely affect the Physical and Biological Features of the species Critical Habitat because of XXX (briefly summarize supporting rationale, etc.).

Species: (common name)
Determination Rationale for Species: This project may affect, but is not likely to adversely affect the XXX because of XXX (briefly summarize supporting rationale, application of AMMs, timing of actions, etc.)
Determination Rationale for Critical Habitat: This project may affect, but is not likely to adversely affect the Physical and Biological Features of the species Critical Habitat because of XXX (briefly summarize supporting rationale, etc.).

SECTION D. ESA REVIEW FOR LAA DETERMINATIONS FOR PROPOSED PROJECTS UNDER THE APPLICABLE FEMA PBA-PBO

D.1. Briefly describe the species potential to occur onsite (including closest CNDDB occurrences, suitable habitat, etc.) and the potential direct and indirect effects from implementation of the Subapplicant's proposed project in the Action Area. Refer to the applicable FEMA PBA-PBO for a description of potential effects, and describe additional effects as applicable.

a. Direct and Indirect Effects on Federally Listed Species (including the potential for take to occur)

[10] Interrelated actions are actions that are part of a larger action and depend on the larger action for their justification (50 CFR §402.02).

[11] Interdependent actions are actions having no independent utility apart from the proposed action (50 CFR §402.02).

b. Direct and Indirect Effects on Critical Habitat (including effects on specific Physical and Biological Features[12]). If there are adverse effects, quantify the area (in acres, square feet, etc.) of Critical Habitat affected.

D.2. Please list all the general *Avoidance and Minimization Measures* and the species-specific *Conservation Measures* that are applicable from the FEMA PBA-PBO , and indicate which will be implemented and why implementation of others is not necessary for the Subapplicant's proposed project to avoid and minimize direct and indirect effects, and briefly note how they would reduce those effects within the Action Area on the following:

a. Federally Listed Species

b. Critical Habitat

Note: Please note that take (as defined under the ESA) of federally listed species and/or destruction/adverse modification to Critical Habitat may occur under an LAA determination.

D.3. Based on the information provided in Sections D.1 and D.2, is there potential for the Subapplicant's proposed project to result in take of a federally listed species?

☐ **YES**

FEMA has determined that the proposed project may result in take of at least one federally listed species, and FEMA is requesting coverage under the ITS previously issued from the USFWS to FEMA under the programmatic consultation for ESA Section 7 compliance to be complete. Complete Sections D.4 through D.10 of this form to make an LAA determination and request coverage under the existing ITS. FEMA will notify the USFWS by submitting the completed ESA Review Form for the proposed project.

☐ **NO**

Complete Sections D.7 through D.10 (skip Sections D.4 through D.6) of this form for LAA determinations. FEMA will notify the USFWS by submitting the completed ESA Review Form for the proposed project.

D.4. Briefly describe the mechanism(s) of take as it may occur from implementation of the Subapplicant's proposed project in the Action Area.
Mechanism(s) of Take

D.5. Describe any additional –project-specific measures that would be implemented to reduce the magnitude of take.

[12] Per 81 *FR* 7414, the physical or biological features refer to the features that are present that are essential to the conservation of the species and may require special management considerations or protection, which were formerly referred to as "Primary Constituent Elements."

D.6. Provide an estimate of the magnitude of take for each federally listed species that may result from the Subapplicant's proposed project, including:

- **Take estimate based on existing population status, if available, otherwise use the area of suitable habitat affected as a surrogate for the take estimate;**
- **References for any materials utilized to develop these estimates.**

a. Species 1 – Estimated Take

b. Species 2 – Estimated Take

c. (Add entries for additional species, if needed)

d. References

D.7. Are there any cumulative effects[13] anticipated from implementation of the Subapplicant's proposed project, including construction activities? If so, please describe them.

D.8. Are there any interrelated[14] and/or interdependent[15] actions associated with the Subapplicant's proposed project? If so, please describe them.

D.9. Are there any other FEMA funded projects occurring within 1 mile of the Subapplicant's proposed project? If so, please list the disaster number (DR), Project Worksheet (PW), project name, and distance to this proposed project.

[13] Cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR §402.02).

[14] Interrelated actions are actions that are part of a larger action and depend on the larger action for their justification (50 CFR §402.02).

[15] Interdependent actions are actions having no independent utility apart from the proposed action (50 CFR §402.02).

D.10. Provide a summary of FEMA's LAA Determination for Federally Listed Species and Critical Habitat from implementation of the Subapplicant's proposed project. List all the federally listed species and/or Critical Habitat that could be directly or indirectly affected, and summarize those effects as they are presented in this Section. An ESA determination for each federally listed species and/or Critical Habitat is required.

Species: (common name)
Determination Rationale for Species: This project may affect, and is likely to adversely affect the XX because of XXX (briefly summarize supporting rationale for the adverse effect determination, application of AMMs, timing of actions, etc.).
Determination Rationale for Critical Habitat: This project may affect, and is likely to adversely affect the Physical and Biological Features of the species Critical Habitat because of XXX (briefly summarize supporting rationale for the adverse effect determination, etc.).

Species: (common name)
Determination Rationale for Species: This project may affect, and is likely to adversely affect the XXX because of XXX (briefly summarize supporting rationale for the adverse effect determination, application of AMMs, timing of actions, etc.)
Determination Rationale for Critical Habitat: This project may affect, and is likely to adversely affect the Physical and Biological Features of the species Critical Habitat because of XXX (briefly summarize supporting rationale for the adverse effect determination, etc.).

SECTION E. FOR USFWS TO COMPLETE AND SIGN

Project Name:
FEMA Grant # or Disaster and Project Worksheet #s:

☐ **I concur with FEMA's determination on federally listed species and critical habitat as described in this ESA Review Form, pursuant to Section 7 of the Endangered Species Act**. The proposed projects are covered activities, and the affects to the Federally-listed species presented in this ESA Review Form have been analyzed in the July 2019, Programmatic Biological Opinion for the Federal Emergency Management Agency's Disaster, Mitigation, and Preparedness Programs within the Ventura Fish and Wildlife Office's Jurisdiction (08EVEN00-2018-F-0700) (programmatic biological opinion).

☐ Take for listed species presented in Section D of this ESA Review Form is exempt under the programmatic biological opinion.

The proposed projects are appended to the July 2019, programmatic biological opinion under the following Service File Number: [FWS will insert TAILS number].Therefore, no further action pursuant to the Act is necessary for the proposed projects unless new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered; or a new species is listed or critical habitat designated that may be affected by the identified action.

☐ **I do not concur with FEMA's determination for the following reason(s):**

Signature is listed below:

_____ _____

[Name] **Date**
Assistant Field Supervisor
Ventura Fish and Wildlife Office
U.S. Fish and Wildlife Service

Appendix D

U.S. Fish and Wildlife Service and California Department of Fish and Wildlife

Draft Conservation Strategy and Mitigation Guidance for the California Tiger Salamander, Santa Barbara County Distinct Population Segment

Information in this document is presented in the following order:

1. Purpose
2. Conservation Strategy
3. Impacts to California tiger salamanders
4. Mitigation to Offset Impacts
5. Determining Mitigation
6. Providing Mitigation
7. Siting Mitigation
8. Translocation

This document is not meant to contain complete information regarding species biology, regulatory requirements, U.S. Fish and Wildlife Service policies, or compensatory mitigation procedures. Additional materials supporting this document and providing supplemental information relevant to this topic are indicated within this document. This document will be updated as needed to reflect new scientific information, species needs, or policy changes.

1. Purpose

The U.S. Fish and Wildlife Service (Service) provides this conservation strategy and mitigation guidance document in support of the conservation and recovery of the endangered Santa Barbara County distinct population segment (DPS) of the California tiger salamander. The main purpose of this document is to provide guidance when assessing land use and project development impacts to the Santa Barbara County DPS of the California tiger salamander and to strategically identify our preferred approaches to offset unavoidable impacts through compensatory mitigation when triggered under the Federal Endangered Species Act of 1973, as amended. The recommendations from this document should be assessed and, when appropriate, incorporated into all projects occurring within the known range of the DPS. We recommend that biologists, consultants, and project proponents use it to inform and facilitate their work with the Service in a regulatory context.

The Federal Endangered Species Act of 1973, as amended, is the primary Federal law providing protection for the Santa Barbara County DPS of the California tiger salamander. The listing of the DPS as endangered provided the full protection of Act. Sections 7, 9, and 10 of the Act have been the most relevant sections that have provided a conservation benefit to the species. Section 9 of the Act prohibits unauthorized taking of any federally listed endangered or threatened species. Section 3(18) defines "take" to mean "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

2. Conservation Strategy

The goal of this conservation strategy and mitigation guidance is to protect and manage sufficient habitat to support long-term viability of the Santa Barbara County DPS of the California tiger salamander. The species depends on a series of interconnected aquatic breeding habitats and upland habitats as a metapopulation, making it particularly sensitive to changes in the amount, configuration, and quality of these habitats. The loss and destruction of habitat represents the primary threat to the species. We believe that to ensure the long-term viability of California tiger salamander populations in Santa Barbara County, habitat loss needs to be reduced and that California tiger salamander habitat needs to be conserved and protected following strategic methodology. The recovery plan (Service 2016) lays out recovery criteria by which a minimum viable population can be conserved in each metapopulation area. This conservation strategy and mitigation guidance strives to conserve habitat in a strategic way through mitigation such that recovery criteria will be met in each metapopulation.

Aquatic breeding habitat for California tiger salamanders is characterized as ponds with seasonal, shallow wetlands that alternate between dry and wet periods. For regulatory purposes, ponds with a documented breeding California tiger salamander population are identified as known breeding ponds. Ponds with the appropriate hydroperiod to support California tiger salamander breeding (i.e., at least 10 weeks) and surrounding upland habitat, but in which

California tiger salamander breeding has not been documented, are identified as potential breeding ponds. Potential breeding ponds may have breeding California tiger salamander populations that have not been documented for a variety of reasons, including insufficient survey effort. Salamanders can forego breeding for 2 to 8 years, resulting in negative aquatic surveys despite the presence of the species in adjacent uplands (Trenham et al. 2000). For the purpose of this document, potential breeding ponds are treated the same as known breeding ponds. For project purposes, potential breeding ponds are presumed to be known breeding ponds unless a negative finding is achieved by correctly and completely following the Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander (Service and Department 2003).

We used the average size of known breeding ponds in Santa Barbara County (1.47 acres) to define the number of ponds needs in each metapopulation area to support a minimum viable population size of California tiger salamanders. Four ponds of this size are required to preserve a minimum viable population for each metapopulation based on calculations that are discussed in the Service's (2015) draft recovery plan. In metapopulation areas where ponds are smaller than 1.47 acres, more than 4 ponds may be needed to support the minimum viable population size because effective population size is related to pond area. For example, if ponds are 0.4 acres, then 5 ponds will be necessary to support a minimum viable population size.

To preserve the minimum viable population found in single pond, at least 623 acres of functional upland habitat around each pond is required. 623 acres of functional upland habitat encompasses approximately 75 percent of the individuals using that pond based on calculations that are discussed in the Service's 2016 recovery plan. The remaining 25 percent of the population is distributed across an additional 1,628 acres of functional upland habitat.

Compensatory mitigation should work to further meeting recovery criteria. The recovery plan (Service 2016) established the following recovery criteria to support long-term viability of the Santa Barbara County DPS of the California tiger salamander:

1. At least four functional breeding ponds are in fully preserved status per metapopulation area.

2. A minimum of 623 acres of functional upland habitat around each preserved pond is in fully preserved status.

3. Adjacent to the fully preserved ponds and fully preserved upland habitat, a minimum of 1,628 acres of additional contiguous, functional upland habitat is present, which is at least 50 percent unfragmented and partially preserved.

4. Effective population size in the metapopulation is, on average, increasing for 10 years.

5. Management is implemented to maintain the preserved ponds free of non-native predators and competitors (e.g., bullfrogs and fish).

6. Risk of introduction and spread of non-native genotypes is reduced to a level that does not inhibit normal recruitment and protects genetic diversity within and among metapopulations.

Given the different landscape context in each metapopulation area, the method in which recovery criteria will be met in each metapopulation will differ (see Table 1 below). The first priority is preservation of existing ponds, followed by restored or created ponds – metapopulations that are limited by the number of functional breeding ponds would likely require the creation of additional breeding ponds to meet the first recovery criteria as listed above.

Table 1. The six metapopulation areas of the Santa Barbara County DPS of the California Tiger Salamander and the actions the Service currently envisions are necessary to achieve recovery, including the number of breeding ponds needed to maintain a minimum viable population size (MVP). The average pond size was calculated using the geometric mean of all known breeding ponds in each metapopulation based on 2010 known California tiger salamander breeding pond data; number of breeding ponds needed to maintain an MVP was calculated as defined in Appendix A of the recovery plan (Service 2015). These calculations should be updated as new information about known breeding ponds is acquired.

Metapopulation	**Number of Known Breeding Ponds**	**Average Size of Known Breeding Ponds (acres)**	**Number of Breeding Ponds Needed to Maintain an MVP**	**Upland habitat in fully preserved status needed (acres)**	**Current Recommended Recovery Actions**
West Santa Maria/Orcutt	15	0.76	4	2,492	Preservation of existing ponds to conserve a minimum viable population
East Santa Maria	5	1.31	4	2,492	Prioritize preservation of existing ponds and restore those as identified in the draft recovery plan (Service 2015)
West Los Alamos	11	0.51	5	3,115	Preservation of existing ponds to conserve a minimum viable population
East Los Alamos	4	1.12	4	2,492	Pond creation will likely be necessary in this metapopulation to

					support a minimum viable population size
Purisima	19	0.42	5	3,115	Preservation of existing ponds to conserve a minimum viable population
Santa Rita	5	0.64	4	2,492	Prioritize preservation of existing ponds, restore or create ponds if necessary, and restore upland habitat as identified in the draft recovery plan (Service 2015)

3. Impacts to California tiger salamanders

For projects that have unavoidable adverse effects on California tiger salamanders and/or their habitats, compensatory mitigation is needed to conserve California tiger salamanders. The amount of compensatory mitigation to offset a proposed project's impacts should be determined by assessing a project's level of impacts to California tiger salamanders and their habitat. Impacts to California tiger salamanders result from direct mortality to individuals, loss or alteration of suitable breeding habitat, loss or alteration of suitable upland habitat, interference with breeding migration, or interference to dispersal and connectivity between metapopulations. Impacts may be permanent or temporary, direct or indirect, immediate or cumulative.

4. Mitigation to Offset Impacts

Mitigation is typically defined as avoiding, minimizing, rectifying, reducing, and then compensating for unavoidable impacts that result from a project, to a species or its habitat. Projects should incorporate conservation measures that help to avoid, reduce, or minimize impacts. Under this conservation strategy and mitigation guidance, any remaining impacts to the California tiger salamander or its habitat should be offset through compensatory mitigation undertaken in a strategic way such that the mitigation contributes to meeting the recovery criteria in the affected metapopulation. Compensatory mitigation, in this document, means physical habitat that is permanently conserved, managed, maintained, and endowed in perpetuity to ensure conservation benefits for the California tiger salamander.

5. Determining Mitigation

The Service will consider a number of primary factors when determining how much mitigation should be provided to adequately offset impacts that will be incurred by a proposed project. These primary factors are:

1. The amount of breeding habitat and/or upland California tiger salamander habitat to be directly or indirectly impacted;

2. The quality of California tiger salamander habitat to be impacted as valued through Searcy and Shaffer (2008);

3. California tiger salamander occupancy and use of the site to be impacted;

4. Number of breeding ponds within dispersal distance (1.3 miles) of the impact area;

5. Location and landscape context of the site to be impacted.

Other factors that should be taken into account by both the Service and the project proponent include: how well the proposed mitigation site supports recovery of California tiger salamander; whether the impact is temporary or permanent; and whether the proposed mitigation to offset impacts provides immediate conservation and recovery benefits to California tiger salamanders

or if there will be a delay in such benefits. The Service prefers that lands to be used for mitigation already contain suitable habitat for the California tiger salamander, as opposed to lands that may need restoration or enhancement, to ensure immediate benefits to the species in exchange for proposed impacts.

6. Providing Mitigation

When a project's impact calls for compensatory mitigation, it can be provided by the project proponent by buying mitigation from a mitigation provider (mitigation bank), by paying a fee towards a Service-approved mitigation account for the California tiger salamander (mitigation account), or by establishing a mitigation site that meets the specification for approved mitigation (permittee-responsible mitigation).

Mitigation Bank

Applicants may purchase credits from an approved conservation bank commensurate with the required mitigation, to provide compensation for impacts to California tiger salamanders. Performance and success criteria for providing compensation for impacts to the California tiger salamander will be deemed to have been met upon purchase of such credits.

In order to determine how many credits an applicant must purchase, the applicant must calculate the loss of reproductive value that would result from their project. The Service has calculated the average reproductive value of one credit at approved conservation banks as a means to determine how many credits a project proponent must purchase to offset the loss in reproductive value resulting from a project. An applicant must purchase as many credits needed to reach a mitigation ratio of 1:1 for reproductive value. For example, if a credit at a conservation bank has a reproductive value of 100 and a project results in a reproductive loss of 200, that project proponent must purchase 2 credits from that bank to offset the loss in reproductive value. Project proponents that are proposing to purchase mitigation credits from a conservation bank should coordinate with the Service to ensure they are using the correct reproductive value of one credit from the conservation bank in which the project proponents proposes to purchase credits from.

For those pursuing compensatory mitigation for impacts occurring in the East and West Los Alamos, Purisima, or Santa Rita metapopulation areas, but unable or not interested in establishing and securing a mitigation site, it may be possible to pay an fee to or to purchase credits from a mitigation site or mitigation bank, each of which could result in providing California tiger salamander conservation benefits commensurate with project impacts. Paying a fee or purchasing credits both entail a payment of U.S. dollars by the entity needing to provide mitigation to a third party who will provide that mitigation. This payment is relatively simple and fast compared to permittee-responsible mitigation.

For project proponents intending to provide compensatory mitigation for impacts occurring in the East and West Los Alamos, Purisima, or Santa Rita metapopulation areas by purchasing credits from a bank, the Service will determine the quality of California tiger salamander habitat as valued through Searcy and Shaffer (2008) for each credit within the bank. The Service and Department will then use that to set the appropriate number of credits for perspective projects to purchase the required mitigation ratio (defined below under *Methodology on How to Determine Mitigation*).

California Tiger Salamander Mitigation and Conservation Account

The Service created a California tiger salamander Mitigation and Conservation Account that is intended to collect mitigation fees for impacts to the California tiger salamander that occur in the East and West Santa Maria metapopulation areas. While there are six metapopulations of the Santa Barbara County distinct population segment of the California tiger salamander, the East and West Santa Maria metapopulation areas are under the greatest threat from land conversion and habitat loss. In order to avoid precluding recovery in these metapopulation areas, mitigation for impacts in West Santa Maria and East Santa Maria should occur within these metapopulations areas. Therefore, the mitigation account pertains only to mitigation fees resulting from impacts occurring in the East and West Santa Maria Metapopulation areas and will be used for mitigation within these metapopulations. With the current prices of property, single applicants are unable to purchase land as mitigation for their projects. Therefore, a mitigation account is necessary to compile funds from multiple projects to be able to purchase parcels of land to put into conservation easements for the California tiger salamander in the Santa Maria metapopulation areas.

The Account is held, managed and administered by the National Fish and Wildlife Foundation to receive monies paid by project applicants in connection with offsetting impacts to the California tiger salamander occurring in the East and West Santa Maria metapopulations. These monies will be received as compensation for unavoidable impacts to the California tiger salamander. The types of activities for which the Account will be used include, but are not necessarily limited to: habitat restoration and enhancement; long-term protection of habitat, including establishment of conservation easements on habitat lands and/or long-term management and monitoring of habitat lands; and recovery activities. These activities will only be implemented in the East and West metapopulations for the California tiger salamander, Santa Barbara distinct population. The Service recognizes that a temporal loss may occur between a project's impacts and implementation of compensatory mitigation. In order to minimize the extent of the temporal loss, funds should be used to implement the aforementioned activities within 5 years of the date of deposit.

In 2017, the Service calculated the reproductive value of one mitigation credit from the La Purisima Conservation Bank. At the time, one credit had a reproductive value of 850. The

Service used that number to establish a mitigation fund fee calculator to determine the mitigation fee needed to offset the loss in reproductive value resulting from a project. The Service consulted with the National Fish and Wildlife Foundation to develop a mitigation fund fee calculator (Service 2017) to account for various fees associated with establishing a conservation easement. The Service anticipates revisiting the fund fee calculator every 5 years to ensure the accuracy of the fee calculator. The calculator is based on the loss of reproductive value resulting from a project to ensure a mitigation ratio of 1:1 [as calculated in Searcy and Shaffer (2008)] is met for the impacts to California tiger salamanders and their habitats. The mitigation fund fee calculator (Service 2017) has detailed information about how mitigation fees are calculated.

Permittee-Responsible Mitigation

Applicants may acquire compensation land to satisfy compensation requirements for impacts to the California tiger salamander. Compensation land must be acquired prior to initiating ground-disturbing activities within the Planning Area and financial assurances must be provided to ensure funding for the long-term management of the compensation lands. All compensation land must be recorded, managed and maintained and endowed in perpetuity prior to the onset of ground-disturbing activities. The compensation land will conserve sufficient reproductive value, as addressed in the Conservation Strategy and Mitigation Guidance for the California tiger salamander (Service 2016), to offset the impacts to the California tiger salamander. As stated above, a mitigation ratio of 1:1 [as calculated in Searcy and Shaffer (2008)] will be required for impacts to California tiger salamanders and their habitats. In other words, the reproductive value of habitat proposed for mitigation should equal the calculated reproductive value of the impacted habitat. When potentially suitable compensation land is identified, the applicant will prepare and submit a report to the Service outlining the suitability of the land for compensatory purposes. Once the Service agrees to the suitability of the compensatory land and the land is placed into conserved status, the performance and success criteria for the provision of onsite compensation lands will be deemed to have been met.

For permittee-responsible onsite or offsite mitigation, applicants will provide for the long-term monitoring and management of the compensation lands by providing initial funding for a long-term, non-wasting endowment. All compensation land must be protected under a perpetual Conservation Easement and be recorded, managed and maintained and endowed in perpetuity prior to the onset of ground-disturbing activities. Applicants must develop a management plan for mitigation lands to be included in a Conservation Easement. The management plan provides for: 1) annual easement inspections, which will generate up-to-date information on the Easement Area's overall condition and biological resources; 2) periodic biological monitoring, which will generate detailed data describing onsite species: including population abundance, condition of habitat and condition of related human infrastructure, particularly water impoundment structures; 3) management, maintenance and enhancement tasks, which will ensure the sustainability of these resources and the health of the species' habitat; and 4) annual reports, which will

summarize maintenance and management activities undertaken during the previous year, and provide an opportunity to creatively consider future needs and adaptive responses.

For those establishing a mitigation site to provide their own mitigation or to establish a bank, it will be necessary to work with the Service to ensure approval of key elements needed to authorize the mitigation site. The Service will provide detailed guidance and feedback on each of the following key elements:

1. Identifying a land parcel(s) adequate for providing compensatory mitigation.
2. Recording a permanent conservation easement on the property.
3. Developing a management plan for the property that documents baseline conditions. A management plan will establish biological goals, objectives, and performance standards, prescribe monitoring and reporting, and provide for adaptive management.
4. Providing financial assurances (specifically, an endowment) for the interim and perpetual maintenance, management, and monitoring of the mitigation site property.
5. Private parties must obtain an Incidental Take Permit (i.e., Section 10 permit pursuant to the Act) or otherwise be covered by an existing permit. This occurs in part by developing a Habitat Conservation Plan (HCP) or being covered by an existing conservation plan. For additional information on HCPs, see: http://www.fws.gov/endangered/what-we-do/hcp-overview.html
6. Federal agencies should complete a consultation (pursuant to section 7 of the Act) in which the proposed project action includes compensatory mitigation to offset impacts California tiger salamanders or their habitat.

7. Siting Mitigation

For all circumstances, mitigation for impacts to California tiger salamanders and its habitat should occur at a location within the affected California tiger salamander metapopulation unless otherwise determined by the Service. In general, large sites functionally connected to other permanently conserved lands are preferred for mitigation as they would likely contribute the greatest toward meeting recovery criteria. Within each metapopulation, compensatory mitigation should be directed to areas encompassing known breeding ponds and their associated upland habitat that contribute in the greatest extent to meeting the aforementioned recovery criteria. Mitigation should be steered away from ponds that are isolated from other ponds in a metapopulation area and/or that do not have sufficient functional upland habitat to support long-term viability of a metapopulation. Proposed mitigation areas should be located within areas that are capable of supporting a minimum viable population of California tiger salamanders. As specified in the Service's 2016 recovery plan, a minimum of 623 acres of functional upland habitat around a preserved pond is necessary to support a minimum viable population. Mitigation

areas must be evaluated and approved by the Service to qualify as mitigation for proposed impacts to California tiger salamanders.

All areas approved for mitigation must be placed into fully preserved status. Fully preserved status is either: (1) owned in fee title by an agency or conservation organization; or, (2) privately-owned lands protected in perpetuity with conservation easements. These lands must have funding secured for long-term management and monitoring. Parcels will be legally and permanently conserved, managed, and endowed to help ensure their long-term ecological value, in a manner consistent with the Service's 2003 Conservation Banking guidance and the Service's most current recommendations for implementing that guidance specific to federally-listed species conservation.

For impacts occurring outside the six metapopulations, mitigation efforts should be directed to the closest defined metapopulation. The Service will evaluate impacts occurring outside of the six metapopulations and provide recommendations and guidance on where compensatory mitigation should be directed on a case-by-case basis. The different metapopulations within Santa Barbara County are shown by different colors on the map located on the following page. These six metapopulations were delineated by the Service upon consideration of the range of the Santa Barbara County DPS of California tiger salamander and are defined by a series of interconnected breeding and upland habitat. These metapopulations could be refined in the future as biological information, recovery needs, and land uses change. We believe that siting mitigation in and adjacent to other parcels that are conserved and managed for similar upland ecosystem functions and values can be advantageous both ecologically and economically.

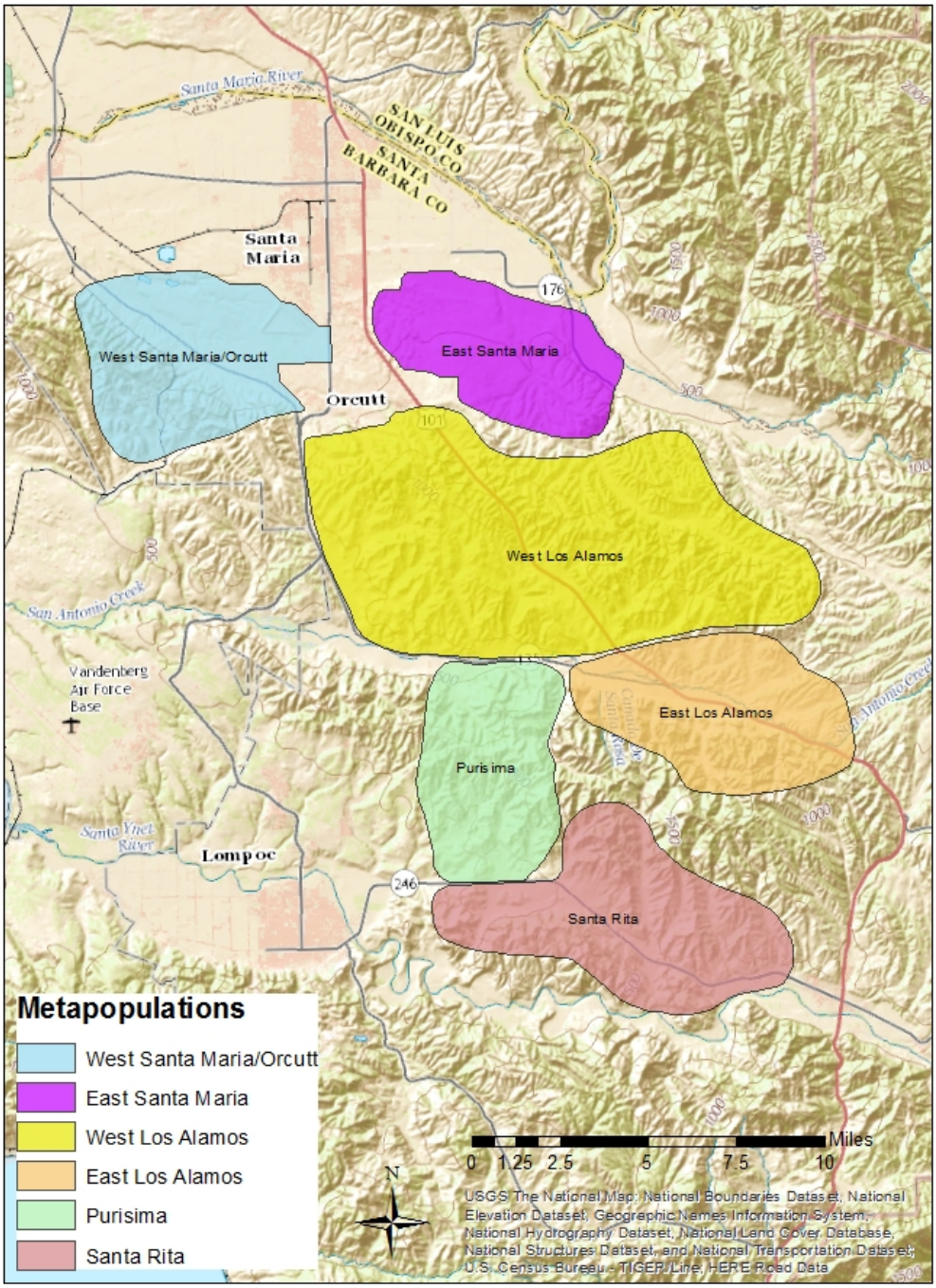
Proposed mitigation areas outside the areas that are capable of supporting a minimum viable population of California tiger salamanders will be considered on a case-by-case basis. Under this scenario, mitigation proposals would likely incur a longer review process and may be subjected to additional requirements, including greater mitigation ratios.

8. Translocation

Translocation involves the human-mediated movement of animals from one area, with release in another. Techniques for successful California tiger salamander translocation are not refined at this time, and there is currently little data on the conservation value of California tiger salamander translocation to the species. In general, we do not consider the translocation of California tiger salamanders for the purposes of removing an individual out of harm's way appropriate mitigation at this time. Since California tiger salamander translocation is not presently viewed as a viable mitigation option by the Service, translocation will occur at the discretion and authorization of the Service on a case-by-case basis. Translocation may be appropriate when recovery or research objectives are likely to be met (i.e., when reestablishing a local population or restocking a breeding pond). A translocation proposal must be submitted to

the Service for evaluation and approval prior to any potential translocation of California tiger salamanders.

Santa Barbara County Disting Population Segment of the California Tiger Salamander



Methodology on How to Determine Mitigation

This section describes the methodology on how to determine the estimated impacts to the Santa Barbara County DPS of the California tiger salamander and amount of compensatory mitigation needed so that project development can move forward where appropriate. Our application of these methods will depend on our evaluation of project-specific conditions. We have considered these methods specifically for use in projects impacting the Santa Barbara County DPS of the California tiger salamander; however, they may have applicability elsewhere.

- The value of the impacted habitat should be calculated using the methodology outlined in Searcy and Shaffer (2008), incorporating the amount of California tiger salamander aquatic breeding habit and upland habitat covering the site to be impacted.

- The value of the land proposed for mitigation habitat should be calculated using Searcy and Shaffer (2008). Typically, a mitigation ratio of 1:1 will be required for impacts to California tiger salamanders and their habitats. Habitat proposed for mitigation should have an equal calculated value of the reproductive value of the impacted habitat. Additionally, habitat proposed for mitigation should be placed into a permanent conservation status.

The method described in Searcy and Shaffer (2008) attaches a value to habitat that scales with the reproductive value of the individuals estimated to be occupying an area.

According to Searcy and Shaffer (2008) the reproductive value of a site is a function of:

a. Distance from each breeding pond within dispersal distance of the site, and
b. Land-use in the surrounding areas.

The density distribution of reproductive value decreases exponentially with increasing distance from a breeding site and decreases with increasing habitat loss in the surrounding uplands. For example, parcels close to a breeding pond, or several ponds, with intact upland habitat in the surrounding area will have a higher reproductive value than those with one pond where upland habitat has been converted to a use that is incompatible with California tiger salamanders.

Studies have recorded migration and dispersal distances by adult and juvenile California tiger salamanders, both through radio-tracking (Loredo et al. 1996, Trenham 2001) and upland drift fence capture (Trenham and Shaffer 2005, Orloff 2007, Orloff 2011). None of these studies were conducted within the range of the Santa Barbara County DPS of the California tiger salamander but are considered to be the best available scientific information on the species. Movement of California tiger salamanders is reviewed in Service (2009) and Searcy et al. (2013). In general, adults may migrate up to 1.2 miles (6,336 feet; 2 kilometers) from upland habitats to aquatic breeding sites (Service 2000). Orloff (2011) found that a considerable number of adult and juvenile California tiger salamanders moved more than 2,625 feet (800 meters) from their

breeding pond, and some more than 1.4 miles (7,392 feet; 2.2 kilometers). Based on studies at Jepson Prairie (Central DPS), researchers estimated that California tiger salamanders use a much greater area around the pond, as compared to Trenham and Shaffer's (2005) original 2,200-foot (670-meter) estimate, with 95 percent of salamanders found within 1.1 miles (5,587 feet; 1.7 kilometers) of a breeding pond from the most outlying pool edge (Searcy and Shaffer 2008, 2011, Searcy et al. 2013, Service 2015).

The location of a site within, or outside, a metapopulation area affects the site's relative importance to the persistence and recovery of California tiger salamanders. Areas capable of supporting a minimum viable population are those geographies with potential for conservation of upland habitat of at least 623 acres around known breeding ponds. Thus, mitigation should be steered away from ponds that are isolated from other ponds in the metapopulation area and/or that do not have sufficient functional upland habitat to support long-term viability of the population. Mitigation should be applied in a strategic way such that it contributes toward meeting recovery criteria in the metapopulation area where the project occurs.

Methodology for Calculating Permanent vs. Temporary Impacts

In general, Searcy and Shaffer (2008) demonstrate that there are two components of habitat loss for California tiger salamanders: (1) project footprint plus (2) "deficit wedge." The project footprint is the direct loss of habitat where the impact occurs, which is straight-forward in concept. More complex is the "deficit wedge" that results from the impact to habitat. The deficit wedge is the habitat that becomes isolated from a given breeding pond as a consequence of the impact and is rendered inaccessible to a California tiger salamander migrating in a straight line away from the center of a pond. The total impact of the project includes a sum of the footprint and the deficit wedges (or shadows) where habitat has become inaccessible to salamanders from ponds within dispersal distance of the project.

In calculating mitigation owed for impacts to listed species and/or the habitat that supports them, temporary impacts are of a different nature than permanent impacts. Therefore, mitigation for permanent and temporary should be calculated differently. Permanent impacts should be calculated using the methodology outlined in Searcy and Shaffer (2008), as described above. The deficit wedge (shadow) described above is only created by permanent or long-term impacts that impede California tiger salamander that are dispersing across the landscape. For temporary impacts occurring over one dry season (approximately May to October), there is no shadow because there is no habitat that becomes isolated during migration or dispersal. Calculating mitigation owed for temporary impacts only includes the direct loss of habitat within the project footprint where the impact to habitat occurs.

Not all temporary impacts occur over one dry season. For temporary impacts spanning more than one dry season, the aforementioned methodology does not account for impacts that could occur to migrating California tiger salamanders over a rainy season. While the effects are still

temporary, there is a temporary deficit wedge that is created over the rainy season. The lifetime reproductive success of California tiger salamanders is typically low because metamorphs have low survivorship; in some populations, less than 5 percent survive to breed (Trenham 1998). In addition, metamorphs require an extended amount of time before they reach sexual maturity (4 to 5 years) (Trenham et al. 2000). Less than 50 percent of first-time breeding California tiger salamanders typically survive to breed more than once (Trenham et al. 2000). Therefore, we assume that a temporary impact lasting more than 5 years could affect the entire reproductive output of an individual California tiger salamander, such that a temporary impact has the same impact as a permanent impact. Thus, any temporary impact lasting 5 or more years will be treated as a permanent impact as described above. If a temporary impact occurs over one rainy season, we assume that 1/5 of the entire population is potentially permanently affected during that rainy season and we calculate the temporary impact of the deficit wedge as 1/5 of the total reproductive value of the wedge. The following table shows the percentage of the population and the associated percentage of the deficit wedge that would be mitigated for.

Years of Disturbance	Percent of Deficit Wedge to Mitigate
1	20
2	40
3	60
4	80
5	100

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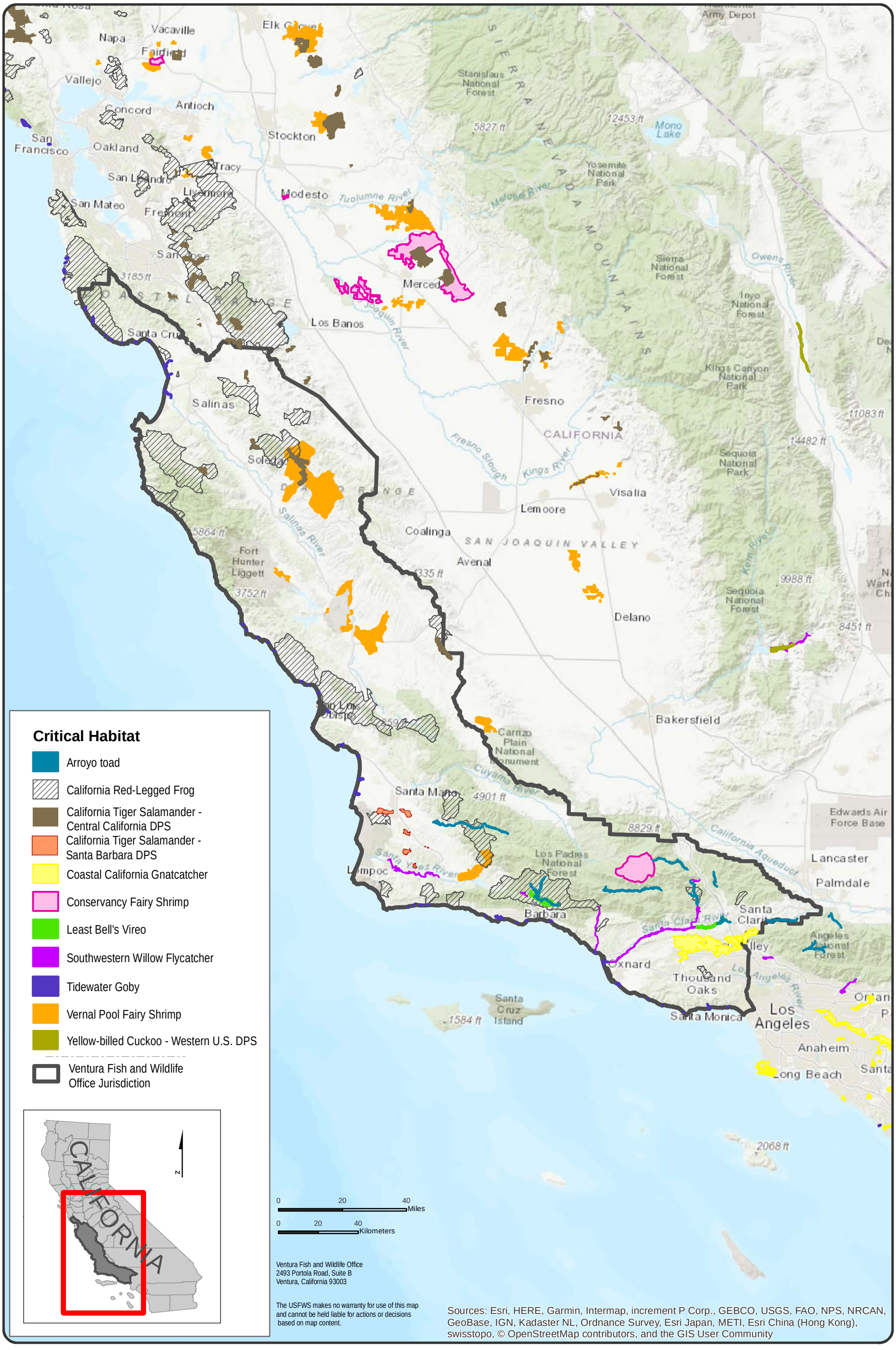
Appendix E

Range Maps for Species Covered in this Section 7 Consultation

U.S. Fish & Wildlife Service

Distribution of Species - Critical Habitat

Ventura Fish and Wildlife Office



Critical Habitat

- Arroyo toad
- California Red-Legged Frog
- California Tiger Salamander - Central California DPS
- California Tiger Salamander - Santa Barbara DPS
- Coastal California Gnatcatcher
- Conservancy Fairy Shrimp
- Least Bell's Vireo
- Southwestern Willow Flycatcher
- Tidewater Goby
- Vernal Pool Fairy Shrimp
- Yellow-billed Cuckoo - Western U.S. DPS
- Ventura Fish and Wildlife Office Jurisdiction

0 20 40 Miles

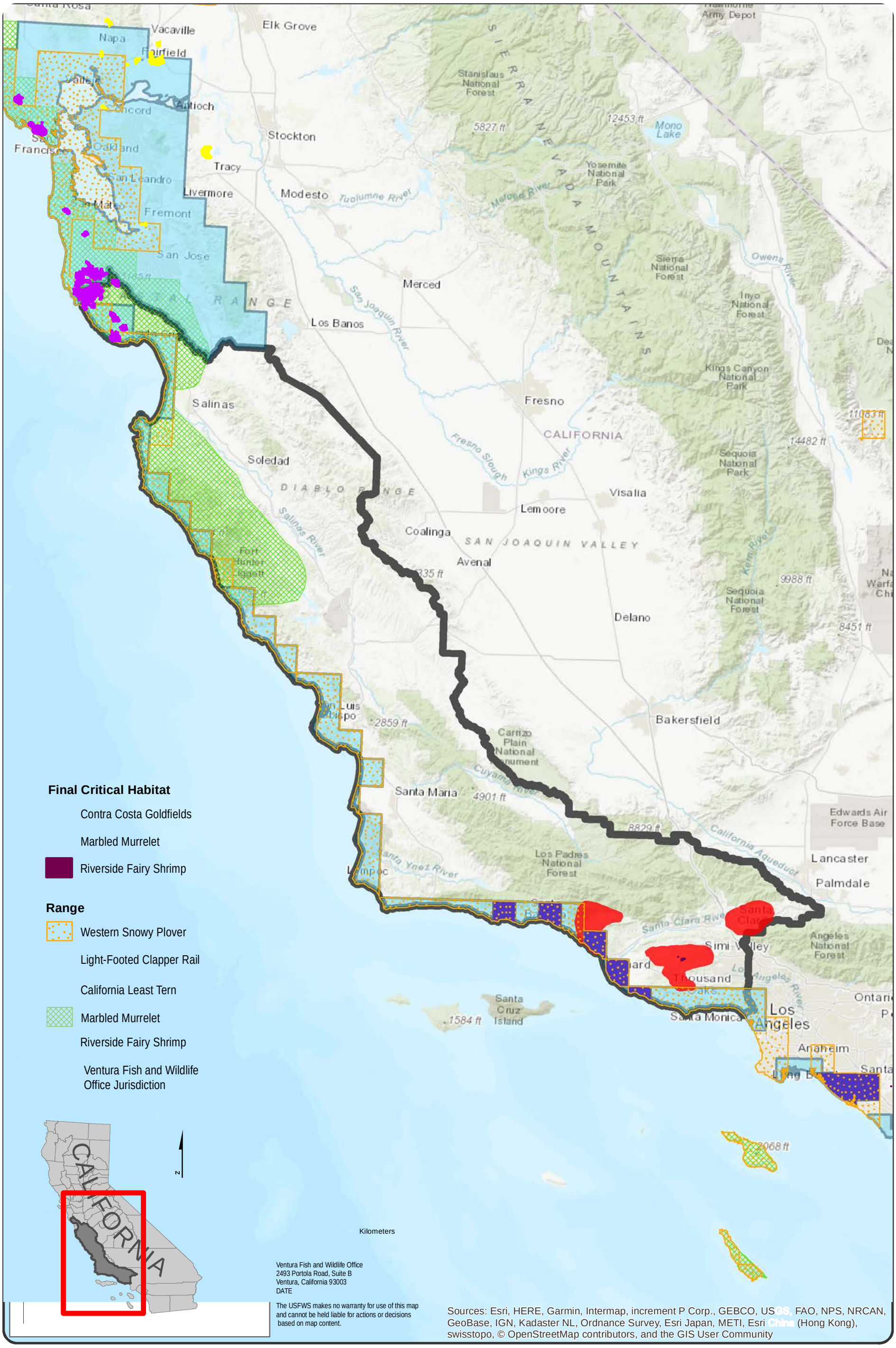
0 20 40 Kilometers

Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

U.S. Fish & Wildlife Service

Distribution of Species - Range and Critical Habitat

Ventura Fish and Wildlife Office



Final Critical Habitat

Contra Costa Goldfields

Marbled Murrelet

Riverside Fairy Shrimp

Range

Western Snowy Plover

Light-Footed Clapper Rail

California Least Tern

Marbled Murrelet

Riverside Fairy Shrimp

Ventura Fish and Wildlife Office Jurisdiction

Kilometers

Ventura Fish and Wildlife Office
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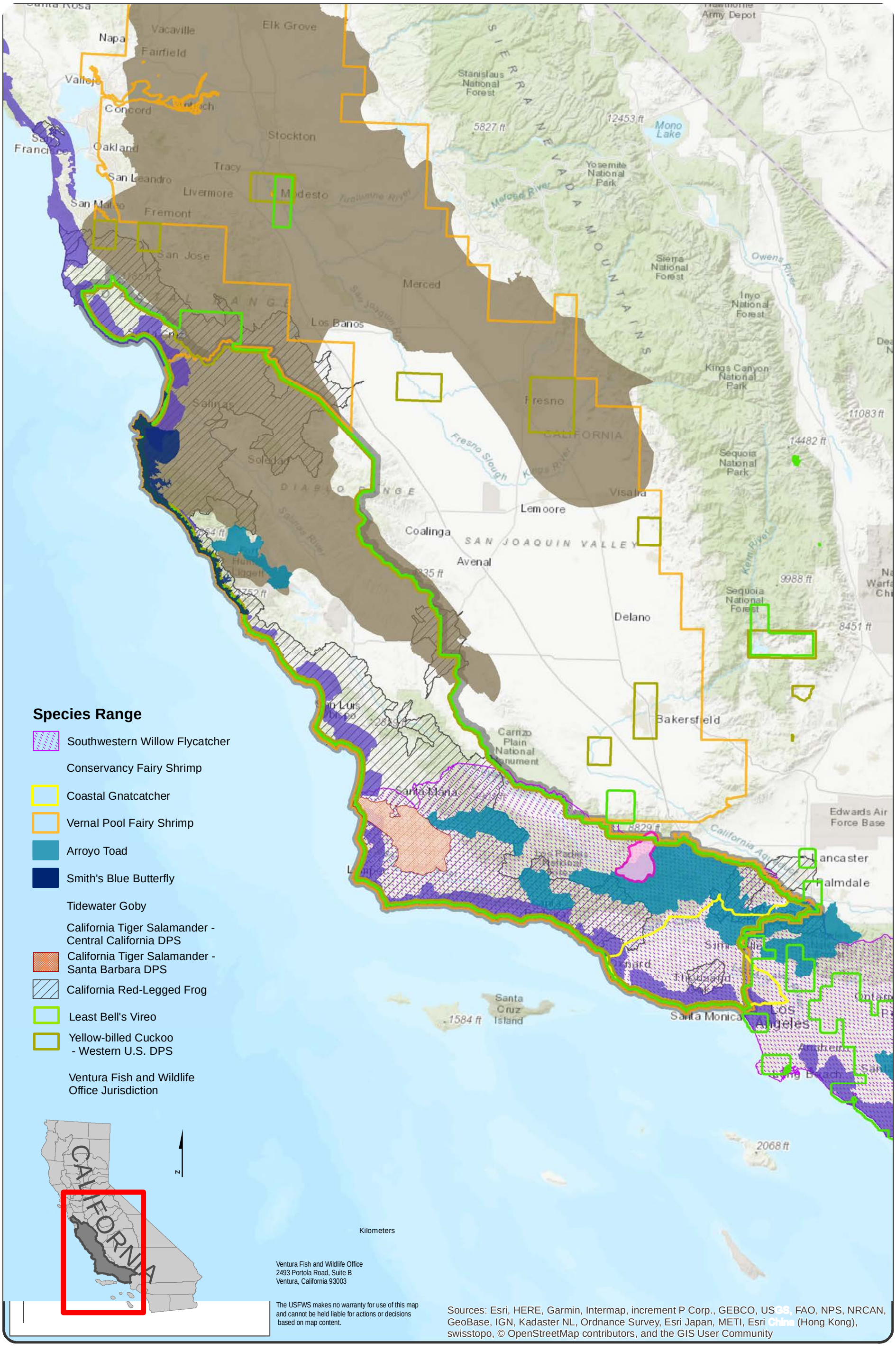
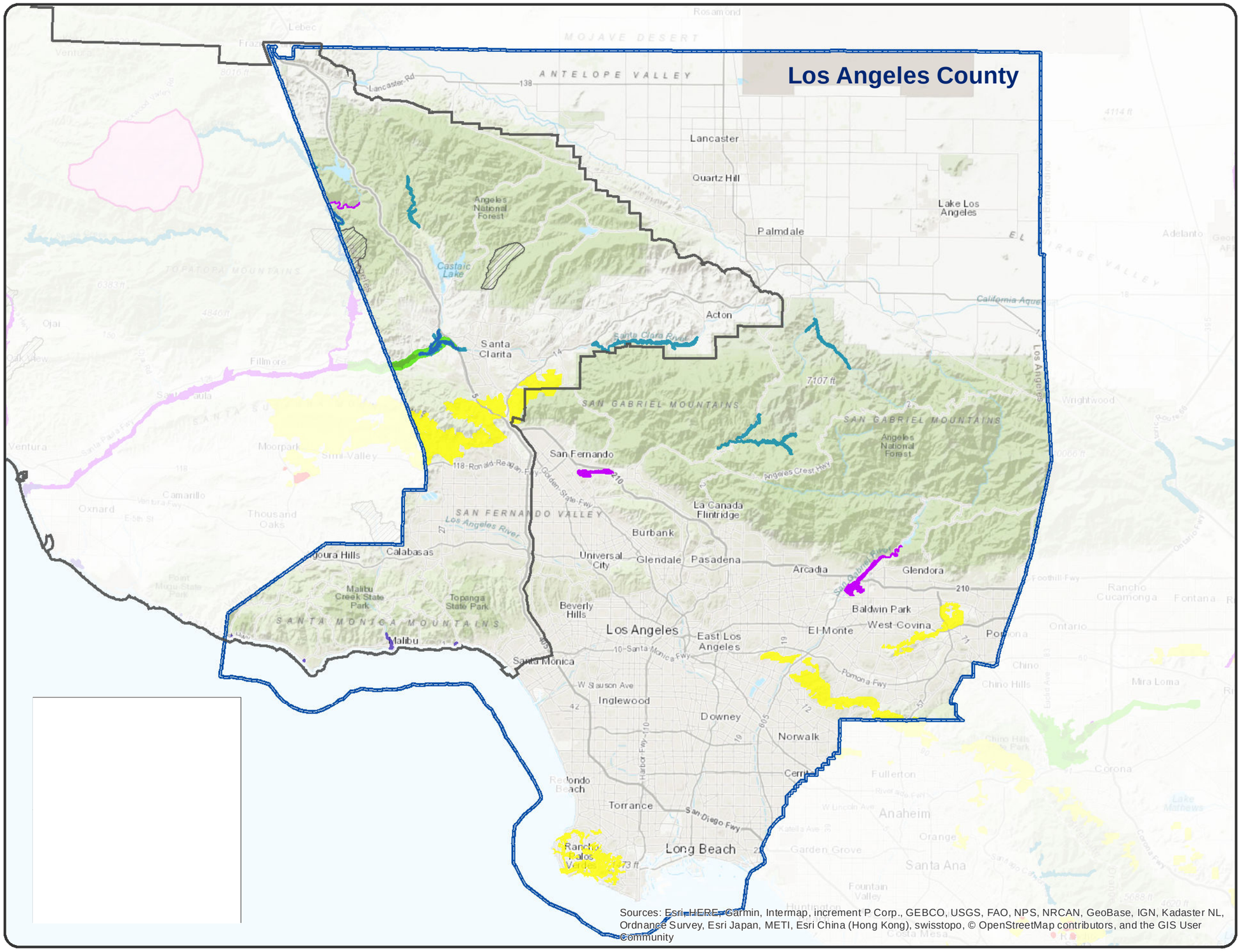
Ventura, California 93003
DATE

U.S. Fish & Wildlife Service

Distribution of Species - Range

Ventura Fish and Wildlife Office





U.S. Fish & Wildlife Service

Los Angeles County

Critical Habitat

- Arroyo Toad
- California Red-Legged Frog
- Coastal California Gnatcatcher
- Least Bell's Vireo
- Tidewater Goby
- Southwestern Willow Flycatcher

- Ventura Fish and Wildlife Office Jurisdiction
- Los Angeles County

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Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

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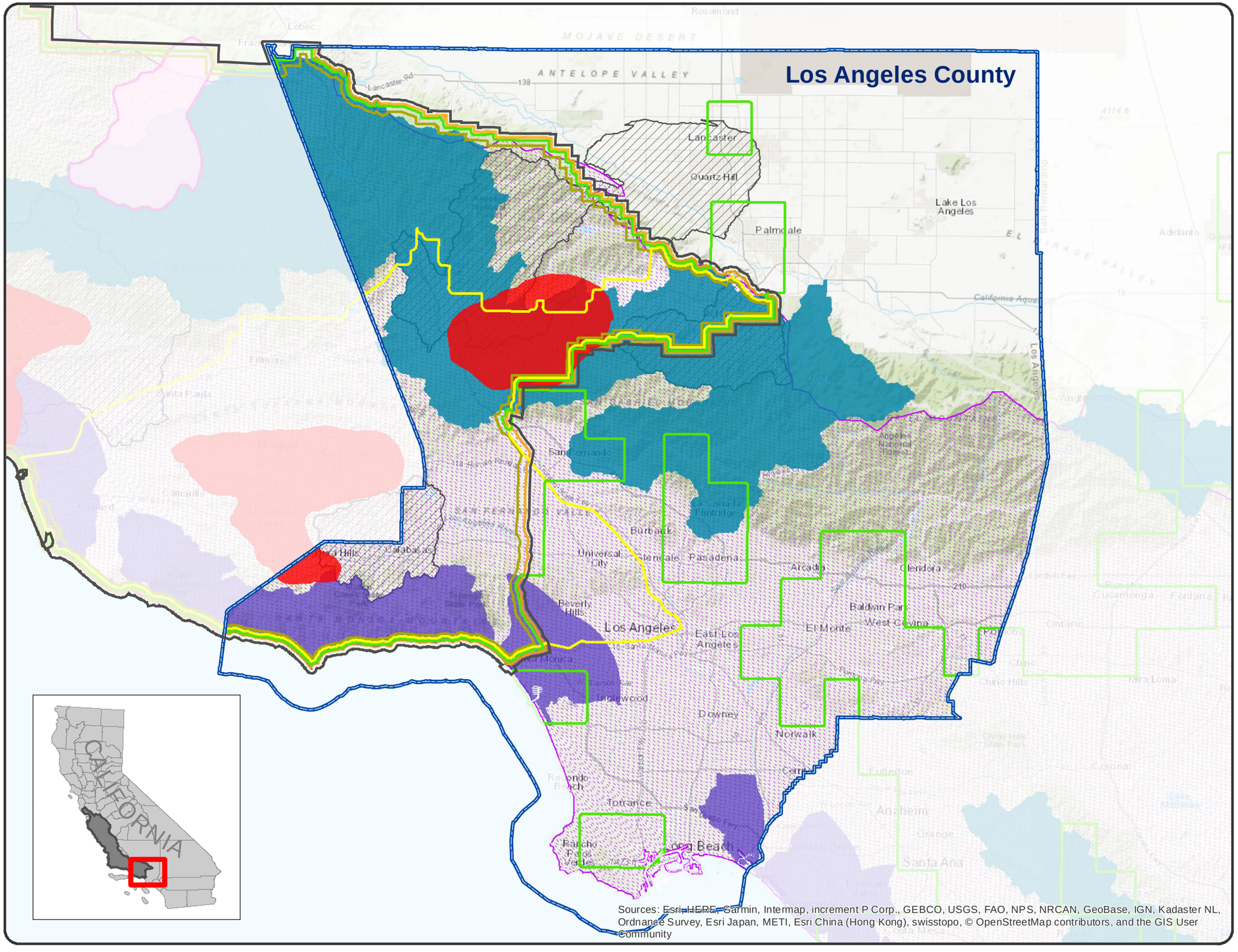

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

U.S. Fish & Wildlife Service

Los Angeles County

Species Range

- Riverside Fairy Shrimp
- Coastal Gnatcatcher
- Vernal Pool Fairy Shrimp
- Arroyo Toad
- Tidewater Goby
- California Red-Legged Frog
- Least Bell's Vireo
- Southwestern Willow Flycatcher
- Yellow-billed Cuckoo - Western U.S. DPS

- Ventura Fish and Wildlife Office Jurisdiction
- Los Angeles County

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Ventura Fish and Wildlife Office
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Ventura, California 93003

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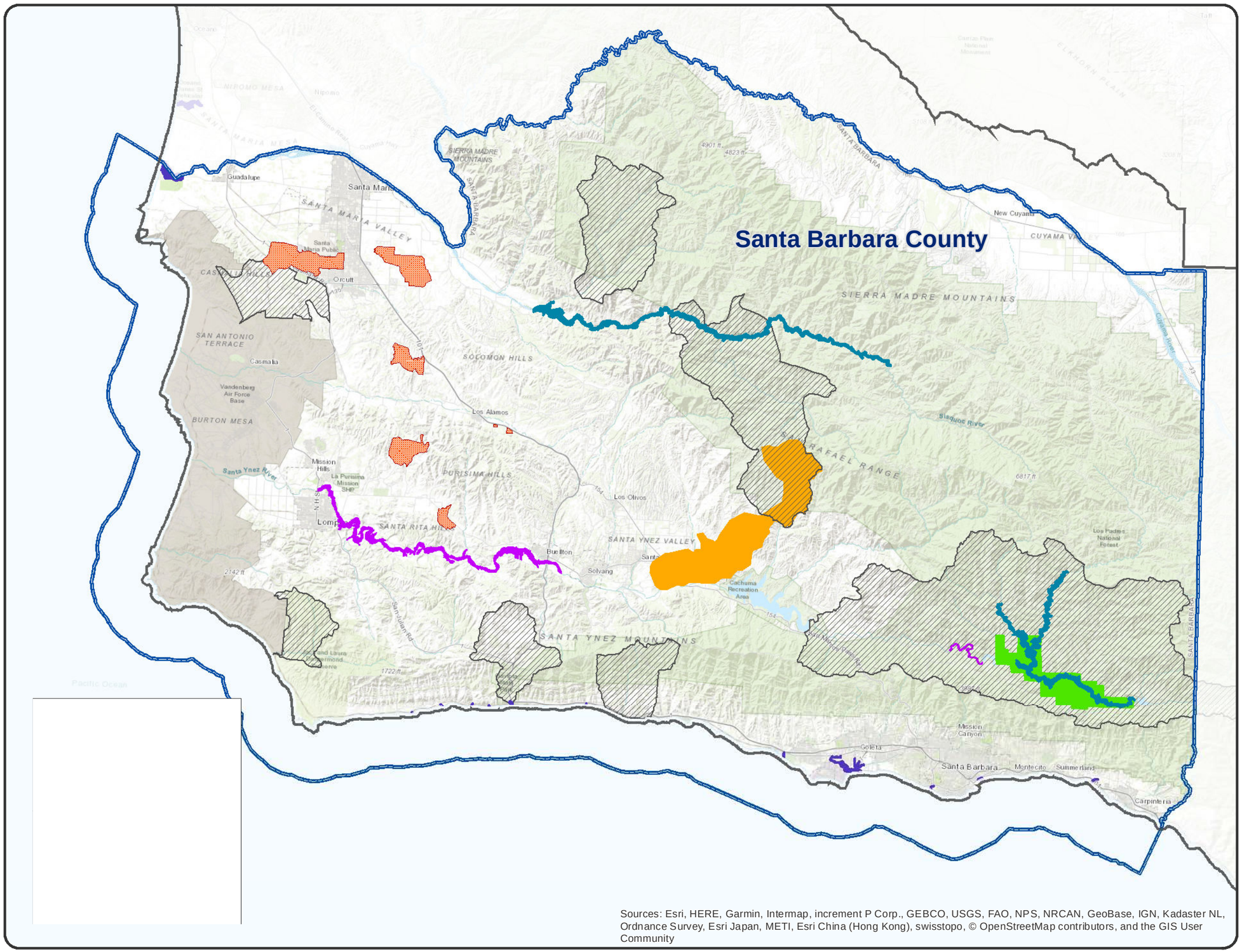

U.S. Fish & Wildlife Service
Santa Barbara County

Critical Habitat

- Arroyo Toad
- California Red-Legged Frog
- Least Bell's Vireo
- Tidewater Goby
- Vernal Pool Fairy Shrimp
- California Tiger Salamander - Santa Barbara DPS
- Southwestern Willow Flycatcher

- Ventura Fish and Wildlife Office Jurisdiction
- Santa Barbara County

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Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

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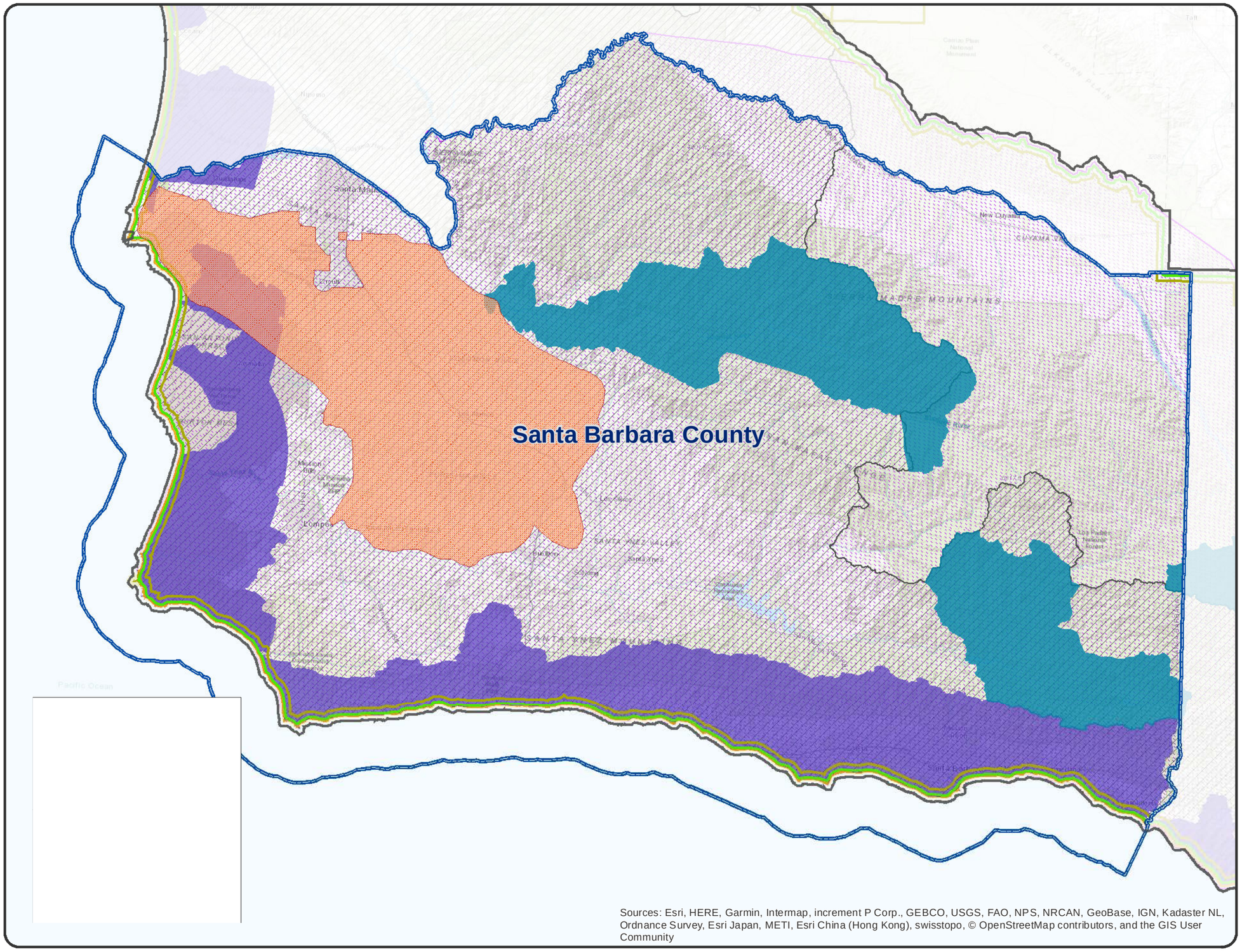

U.S. Fish & Wildlife Service
Santa Barbara County

Species Range

- Vernal Pool Fairy Shrimp
- Arroyo Toad
- Tidewater Goby
- California Red-Legged Frog
- Least Bell's Vireo
- Southwestern Willow Flycatcher
- Yellow-billed Cuckoo - Western U.S. DPS
- California Tiger Salamander - Santa Barbara DPS

- Ventura Fish and Wildlife Office Jurisdiction
- Santa Barbara County

0 5 10 Miles

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Ventura Fish and Wildlife Office
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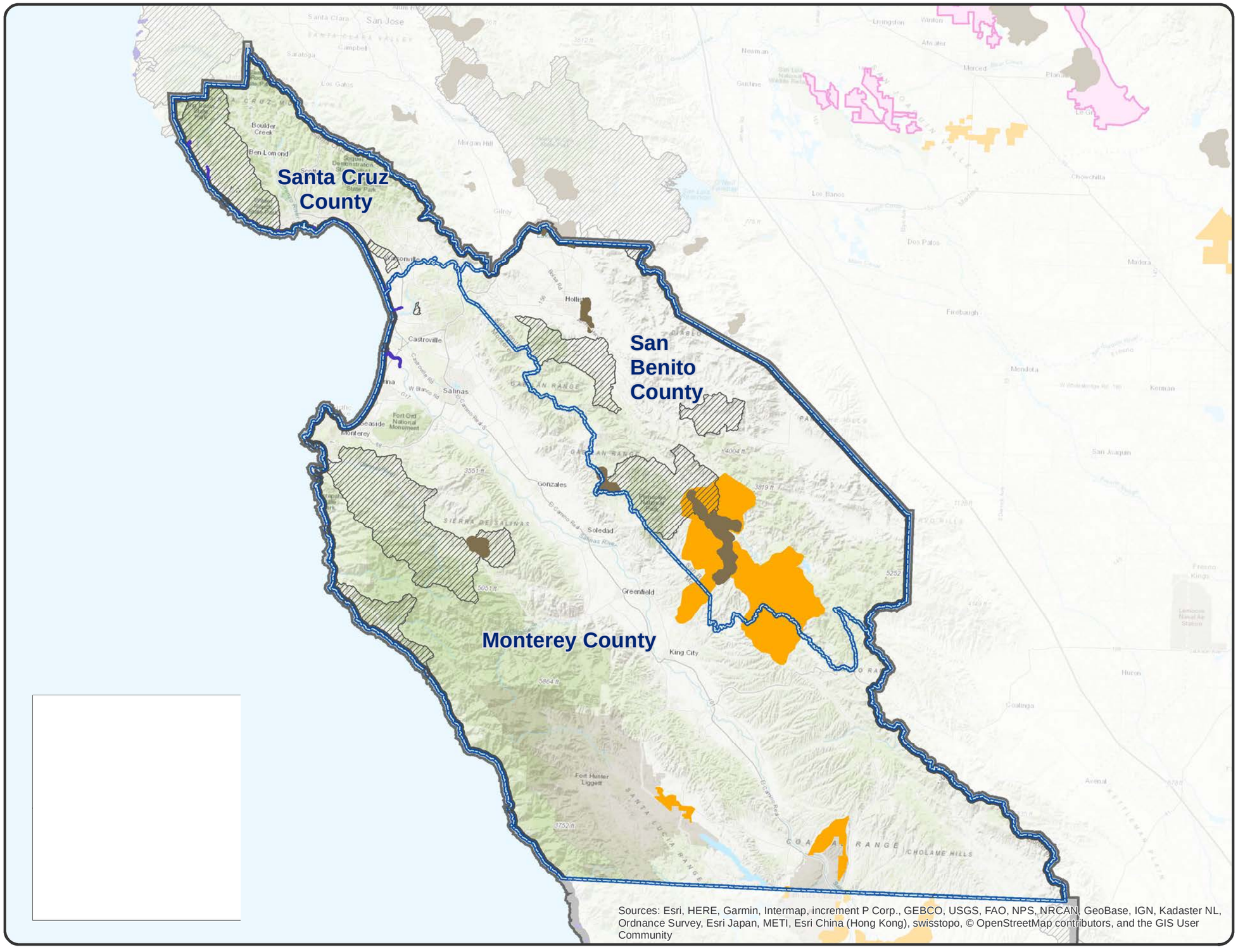

U.S. Fish & Wildlife Service

Monterey, San Benito, and Santa Cruz Counties

Critical Habitat

- California Red-Legged Frog
- California Tiger Salamander - Central California DPS
- Conservancy Fairy Shrimp
- Tidewater Goby
- Vernal Pool Fairy Shrimp

- Ventura Fish and Wildlife Office Jurisdiction
- Monterey, San Benito, and Santa Cruz Counties

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0 10 20 Kilometers

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Ventura, California 93003

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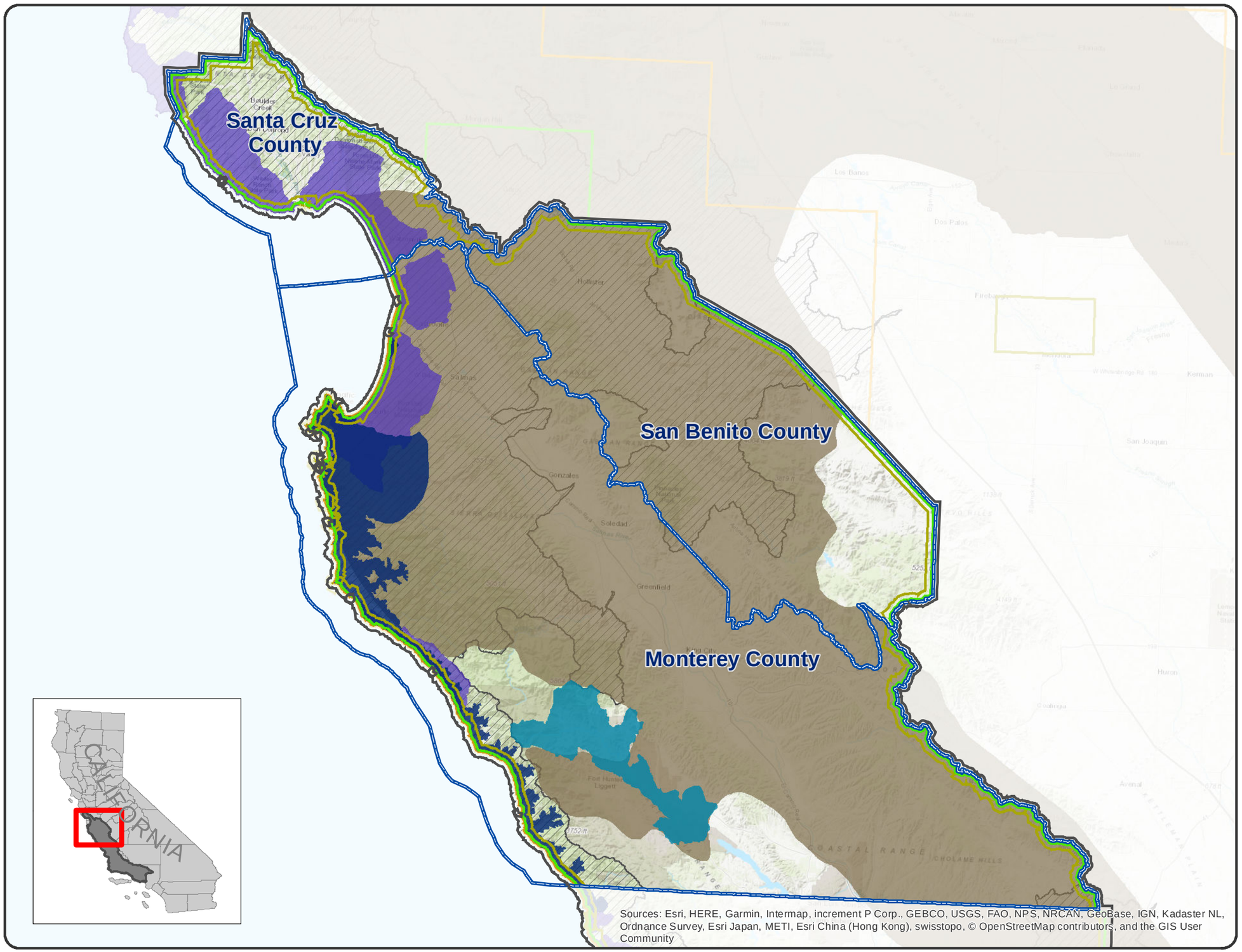

U.S. Fish & Wildlife Service

Monterey, San Benito,and Santa Cruz Counties

Species Range

- Vernal Pool Fairy Shrimp
- Arroyo Toad
- Smith's Blue Butterfly
- Tidewater Goby
- California Tiger Salamander - Central California DPS
- California Red-Legged Frog
- Least Bell's Vireo
- Yellow-billed Cuckoo - Western U.S. DPS

- Ventura Fish and Wildlife Office Jurisdiction
- Monterey, San Benito,and Santa Cruz Counties

0 10 20 Miles

0 10 20 Kilometers

Ventura Fish and Wildlife Office
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Ventura, California 93003
DATE

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U.S. Fish & Wildlife Service
San Luis Obispo County

San Luis Obispo County

Critical Habitat

- Arroyo Toad
- California Red-Legged Frog
- California Tiger Salamander - Central California DPS
- Tidewater Goby
- Vernal Pool Fairy Shrimp

- Ventura Fish and Wildlife Office Jurisdiction
- San Luis Obispo County

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Ventura, California 93003

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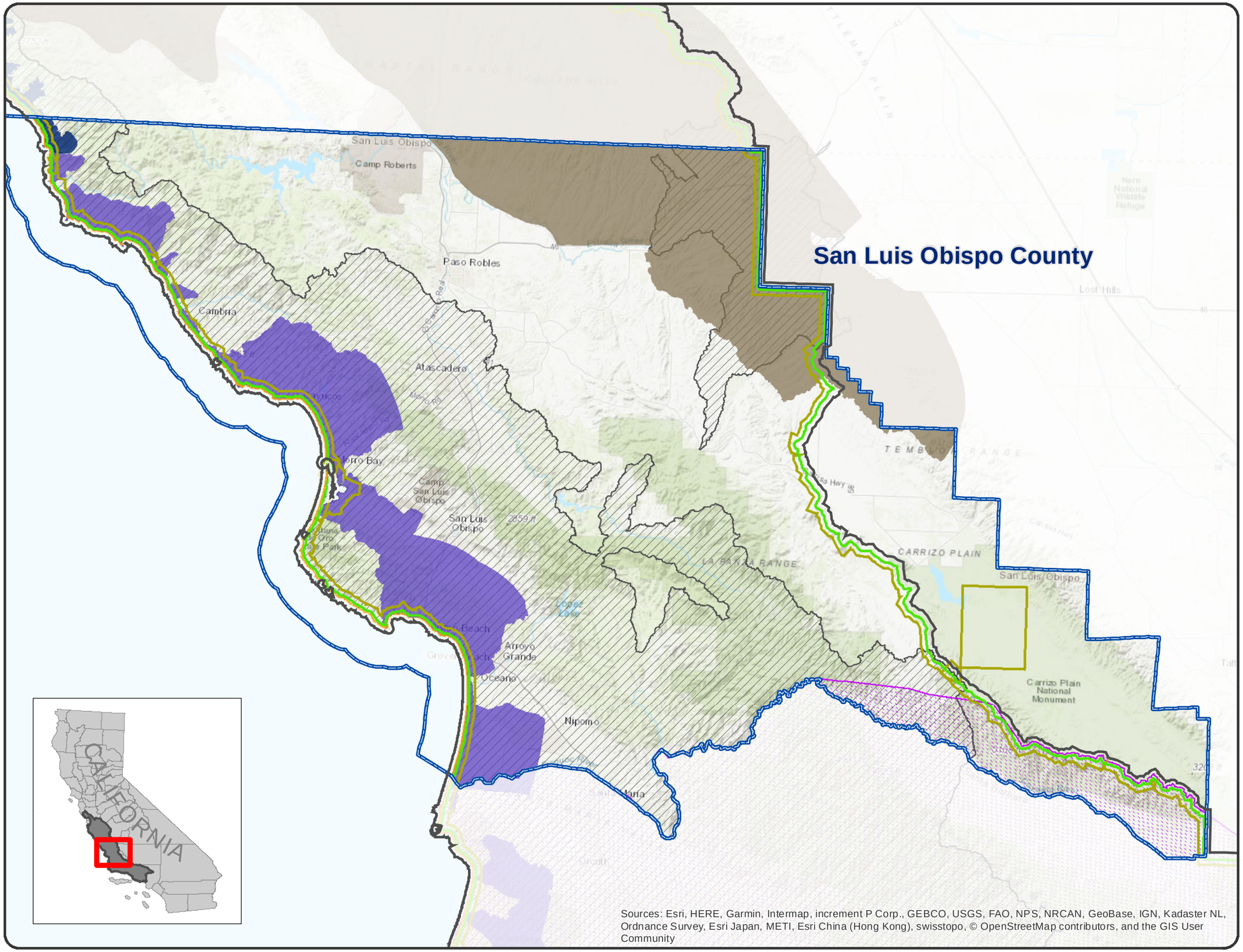

U.S. Fish & Wildlife Service
San Luis Obispo County

Species Range

- Vernal Pool Fairy Shrimp
- Smith's Blue Butterfly
- Tidewater Goby
- California Tiger Salamander - Central California DPS
- California Red-Legged Frog
- Least Bell's Vireo
- Southwestern Willow Flycatcher
- Yellow-billed Cuckoo - Western U.S. DPS

- Ventura Fish and Wildlife Office Jurisdiction
- San Luis Obispo County

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Ventura Fish and Wildlife Office
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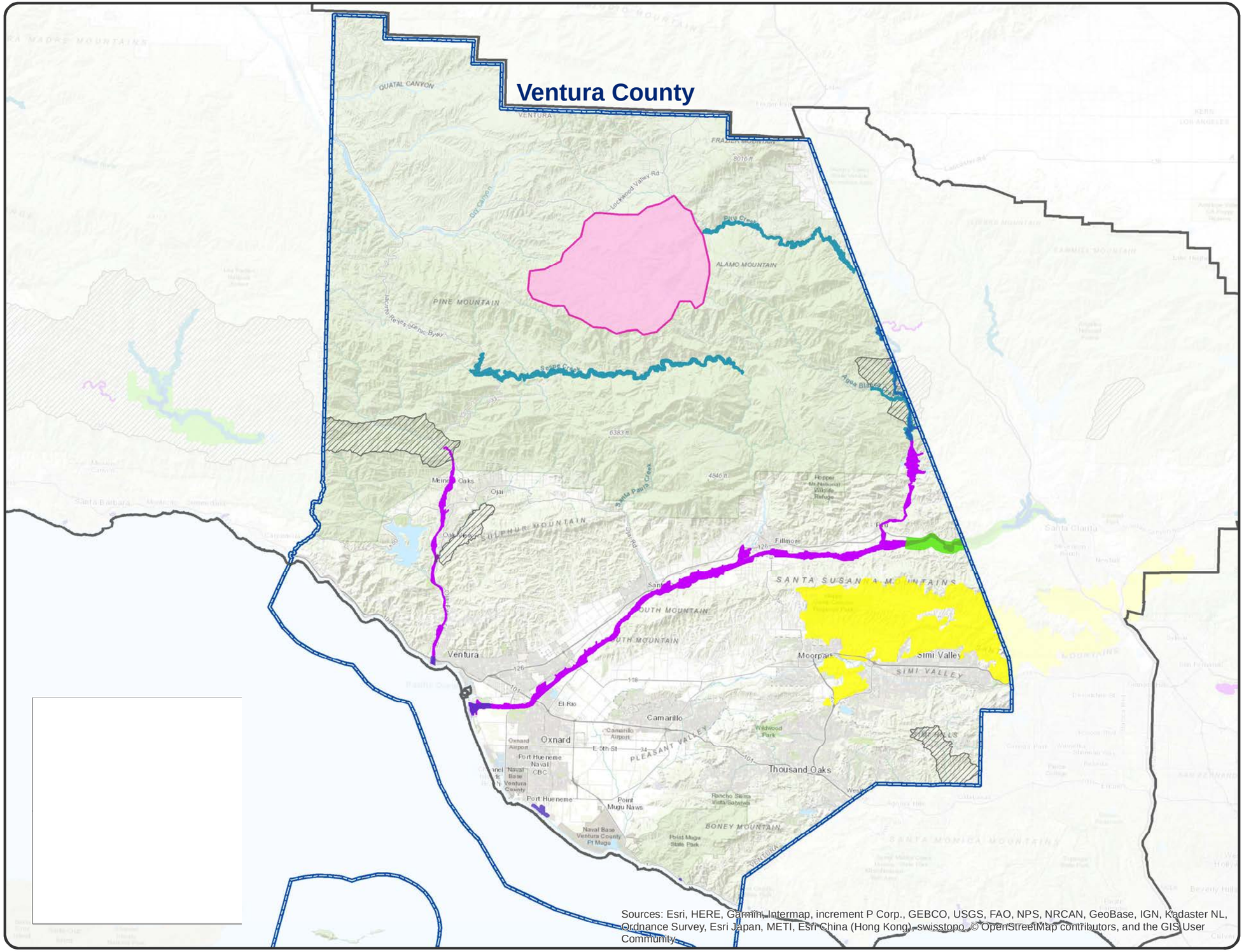
U.S. Fish & Wildlife Service
Ventura County



Critical Habitat

- Arroyo toad
- California red-legged frog
- Coastal California gnatcatcher
- Conservancy fairy shrimp
- Least Bell's vireo
- Tidewater goby
- Southwestern Willow Flycatcher

- Ventura Fish and Wildlife Office Jurisdiction
- Ventura County

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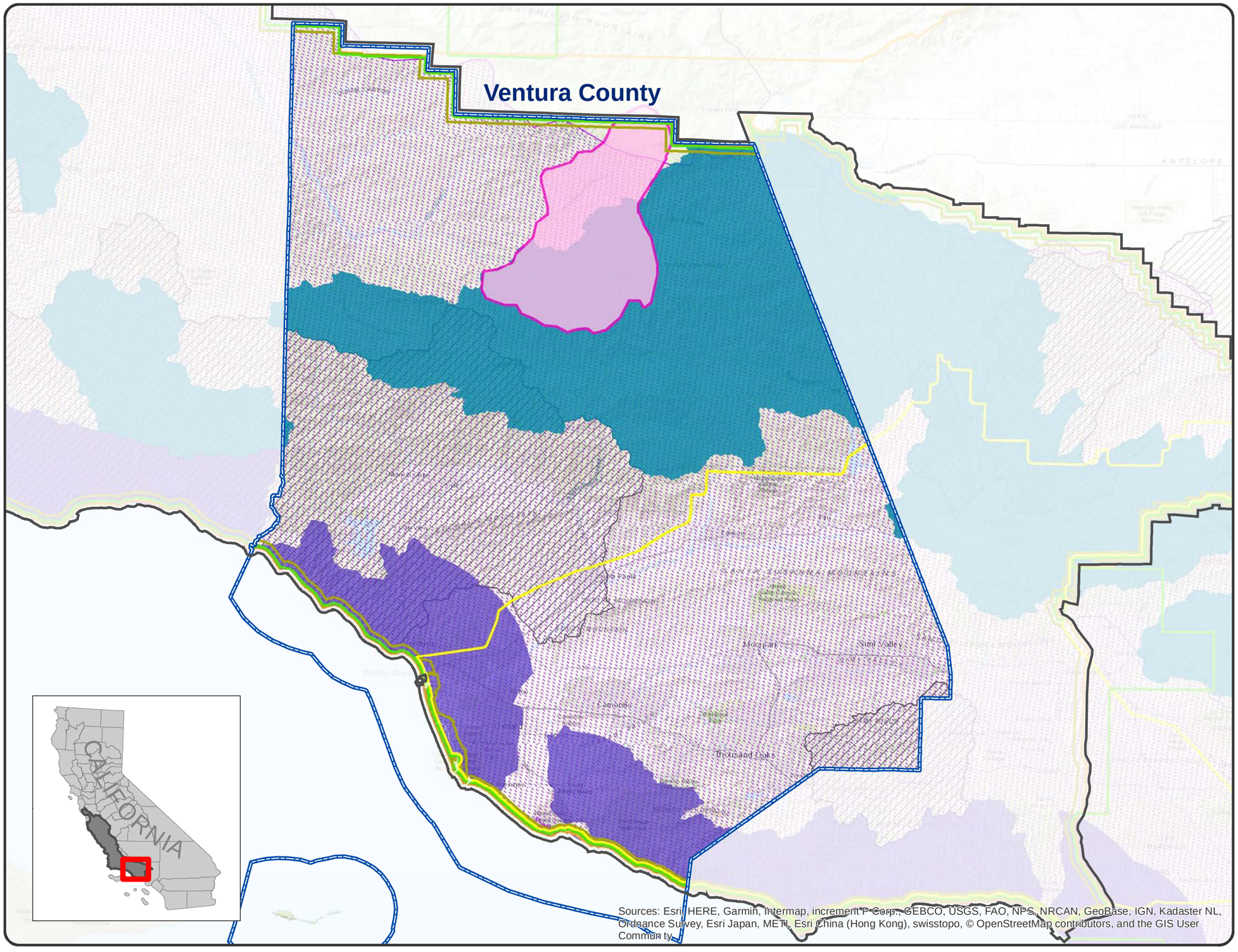

U.S. Fish & Wildlife Service

Ventura County

Species Range

- Conservancy Fairy Shrimp
- Coastal Gnatcatcher
- Vernal Pool Fairy Shrimp
- Arroyo Toad
- Tidewater Goby
- California Red-Legged Frog
- Least Bell's Vireo
- Southwestern Willow Flycatcher
- Yellow-billed Cuckoo - Western U.S. DPS

- Ventura Fish and Wildlife Office Jurisdiction
- Ventura County

0 5 10 Miles

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