TABLE OF CONTENTS

TABLE OF CONTENTS

Exhibits

List of Appendices

TABLE OF CONTENTS

List of Attachments

BA	**Biological Assessment**
BMPs	**Best Management Practices**
CA	**California**
CDFG	**California Department of Fish and Game**
CFR	**Code of Federal Regulations**
CNDDB	**California Natural Diversity Database**
CORPS	**United States Army Corps of Engineers**
EPA	**Environmental Protection Agency**
ESA	**Federal Endangered Species Act**
FDPA	**Federal Disaster Protection Act**
FEMA	**Federal Emergency Management Agency**
LAA	**Likely to Adversely Affect**
NE	**No Effect**
NFIA	**National Flood Insurance Act**
NLAA	**Not Likely to Adversely Affect**
NMFS	**National Marine Fisheries Service**
PA	**Public Assistance**
PL	**Public Law**
PBA	**Programmatic Biological Assessment**
SERVICE	**United States Fish and Wildlife Service**
STAFFORD ACT	**Robert T. Stafford Disaster Relief and Emergency Assistance Act**

California County Abbreviations

Alameda	**ALA**	Marin	**MRN**	San Mateo	**SMT**
Alpine	**ALP**	Mariposa	**MAR**	Santa Barbara	**SBA**
Amador	**AMA**	Mendocino	**MEN**	Santa Clara	**SCL**
Butte	**BUT**	Merced	**MER**	Santa Cruz	**SCZ**
Calaveras	**CAL**	Modoc	**MOD**	Shasta	**SHA**
Colusa	**COL**	Mono	**MNO**	Sierra	**SIE**
Contra Costa	**CCA**	Monterey	**MNT**	Siskiyou	**SIS**
Del Norte	**DEL**	Napa	**NAP**	Solano	**SOL**
El Dorado	**ELD**	Nevada	**NEV**	Sonoma	**SON**
Fresno	**FRE**	Orange	**ORG**	Stanislaus	**STA**
Glenn	**GLE**	Placer	**PLA**	Sutter	**SUT**
Humboldt	**HUM**	Plumas	**PLU**	Tehama	**TEH**
Imperial	**IMP**	Riverside	**RIV**	Trinity	**TRI**
Inyo	**INY**	Sacramento	**SAC**	Tulare	**TUL**
Kern	**KRN**	San Benito	**SBE**	Tuolumne	**TUO**
Kings	**KNG**	San Bernadino	**SBD**	Ventura	**VEN**
Lake	**LAK**	San Diego	**SDG**	Yolo	**YOL**
Lassen	**LAS**	San Francisco	**SFO**	Yuba	**YUB**
Los Angeles	**LAX**	San Joaquin	**SJO**		
Madera	**MAD**	San Luis Obispo	**SLO**		

The Federal Emergency Management Agency (FEMA) administers federal programs for response to, recovery from, and preparation for disasters. Such disasters may result from natural events such as floods, earthquakes, wildfires, and windstorms, or from human-caused events such as fires and explosions.

FEMA, as with all federal agencies, is required under Section 7(a)(2) of the Endangered Species Act of 1973, as amended, (16 U.S.C. 1531 *et seq*.)(ESA) to consult with the U.S. Fish and Wildlife Service (Service) to ensure that any action authorized, funded or carried out by FEMA is not likely to jeopardize the continued existence of any endangered or threatened species under their jurisdiction, or result in the destruction or adverse modification of habitat of such species which is legally designated to be critical. To initiate consultation, FEMA typically prepares a biological assessment (BA) describing the action, the potential effects of that action on listed species, and any conservation measures necessary to avoid adverse effects of the action on listed species and their habitats.

FEMA has determined through experience that the majority of the typical recurring actions proposed for funding, and for which a BA is required, can be grouped by type of action or location. These groups of actions, provided that they meet specified criteria, can be evaluated in a Programmatic Biological Assessment (PBA) to comply with the ESA and its implementing regulations without having to produce a time consuming, stand-alone BA for every action. The PBA is then used as the basis for a programmatic consultation that would ultimately eliminate the need for individual consultations on many actions undertaken by FEMA, except in certain circumstances where an action cannot be appended to a programmatic consultation.

FEMA has prepared this PBA for the purpose of initiating a programmatic consultation with the Service. This PBA describes the types of projects usually funded by FEMA and it evaluates typical recurring actions undertaken by FEMA within the State of California in preparation for, and in the wake of, disasters. This document will facilitate FEMA's compliance with the ESA by providing a framework to address affects to federally-listed species from projects typically funded in response to flood, earthquake, fire, and wind disasters, and to prevent future disasters resulting from these types of events. Through programmatic consultation, the Service and FEMA intend to streamline the consultations process for these typically recurring actions in California.

The Federal Emergency Management Agency (FEMA) administers federal programs for response to, recovery from, and preparation for disasters. Such disasters may result from natural events such as floods, earthquakes, wildfires, and windstorms, or from human-caused events such as fires and explosions. FEMA administers the federal programs under the following authorities:

- The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law (PL) 93-288, as amended (Stafford Act). The Stafford Act authorizes FEMA to administer response, recovery, and mitigation programs. The Stafford Act was amended by the Disaster Mitigation Act of 2000, PL 106-390; it includes the following FEMA programs: the Public Assistance Program; the Hazard Mitigation Grant Program, pre-disaster mitigation programs, the Fire Management Assistance Grant Program, and the Assistance for Individuals and Households Program. The implementing regulations for these programs are found in Title 44, Code of Federal Regulations (CFR), Parts 204 and 206.

- The National Flood Insurance Act, as amended, PL 90-448 (NFIA) and the Flood Disaster Protection Act, PL 93-234 (FDPA) authorizes FEMA to administer programs for mapping flood hazards, providing flood insurance, and providing flood mitigation assistance. Implementing regulations for these programs are found in 44 CFR Parts 59–78.

Typical actions taken under these authorities are described below.

In response to disasters, FEMA is authorized under the Stafford Act to provide state and local governments with assistance that is essential to respond to immediate threats to life, public health and safety, and property. Response activities typically include emergency protective measures to save lives, protection of public health and safety, and protection of improved property. These response activities may be undertaken directly by federal agencies or state and local agencies with financial assistance from FEMA to cover extraordinary costs of such activities.

Under the Stafford Act, FEMA may provide funds to repair, restore, or replace disaster-damaged public facilities as well as facilities owned by certain private nonprofit organizations. Eligible facilities include:

- Roads and associated features, such as lighting, curbs, and sidewalks,
- Bridges, culverts, and associated features, such as abutments, headwalls, and erosion protection,
- Water control facilities, such as embankments, diversion dams, retention basins, and canals,

- Buildings and equipment,
- Utilities, such as water and sewer lines and electrical distribution facilities,
- Mass transit facilities,
- Parks and recreational facilities

Often, the entity applying for assistance (referred to as the "sub-grantee") wishes to take advantage of the opportunity presented by the necessary repair of a disaster-damaged facility to make improvements to, or change the design of, the facility. These actions are referred to as "improved projects." In other cases, the sub-grantee determines that the public welfare would not be best served by restoring a damaged facility or the function of the facility. Funds which are originally available for the restoration of the damaged facility may be made available for the expansion or construction of other selected facilities, the purchase of capital equipment, or the funding of hazard mitigation measures. Such actions are referred to as "alternate projects."

The Stafford Act and the NFIA further authorize FEMA 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 may provide funds for such mitigation measures if they are applied to a specific facility, such as elevating a flood-prone building above the flood elevation, or to reduce risks to the community at large, as through vegetation management to reduce the risk of wildfire. FEMA also may provide funds for the relocation or acquisition of facilities located in areas of hazard, such as floodplains, where repetitive damage is likely to occur.

2.1 PROGRAMMATIC ESA SECTION 7 CONSULTATION

FEMA, as with all federal agencies, is required under Section 7(a)(2) of the Endangered Species Act of 1973, as amended, (16 U.S.C. 1531 *et seq.*)(ESA) to consult with the U.S. Fish and Wildlife Service (Service) to ensure that any action authorized, funded or carried out by FEMA is not likely to jeopardize the continued existence of any endangered or threatened species under their jurisdiction, or result in the destruction or adverse modification of habitat of such species which is legally designated to be critical. To initiate consultation, FEMA typically prepares a biological assessment (BA) describing the action, the potential effects of that action on listed species, and any conservation measures necessary to avoid adverse effects of the action on listed species and their habitats.

FEMA has determined through experience that the majority of the typical recurring actions proposed for funding, and for which a BA is required, can be grouped by type of action or location. These groups of actions, provided that they meet specified criteria, can be evaluated in a Programmatic Biological Assessment (PBA) such as this to comply with the ESA and its implementing regulations without having to produce a time consuming, stand-alone BA for

every action. The PBA is then used as the basis for a programmatic consultation that would ultimately eliminate the need for individual consultations on many actions undertaken by FEMA, except in certain circumstances where an action cannot be appended to a programmatic consultation.

2.2 PURPOSE OF THE DOCUMENT

FEMA has prepared this PBA for the purpose of initiating a programmatic consultation with the Service. This PBA describes the types of projects usually funded by FEMA and it evaluates typical recurring actions undertaken by FEMA within the State of California in preparation for, and in the wake of, disasters. This document will facilitate FEMA's compliance with the ESA by providing a framework to address affects to federally-listed species from projects typically funded in response to flood, earthquake, fire, and wind disasters, and to prevent future disasters resulting from these types of events. Through programmatic consultation, the Service and FEMA intend to streamline the consultations process for these typically recurring actions in California.

This PBA proposes specific criteria, guidelines, and measures that FEMA, the Applicant (*i.e.*, the State of California), and their sub-grantees will follow during the implementation of FEMA-funded projects. **Once the Service has determined through the ESA section 7 consultation process that projects meet the guidelines, criteria, assumptions, and intent, as described throughout this document, the Service will prepare and issue a programmatic "not likely to adversely affect" concurrence letter and a programmatic biological opinion. No additional ESA section 7 consultations with the Service will be required for those projects that meet the guidelines, criteria, assumptions, and intent of this document, and were covered under the programmatic consultations.** FEMA will, however, still need to initiate individual ESA section 7 consultations on all projects that do not meet the guidelines, criteria, assumptions, and intent of this document, and were not covered under the programmatic consultations. The criteria, guidelines, and assumptions proposed in this PBA apply only to projects located where federally-listed species or their habitats occur, or where a project may have an affect on a federally-listed species or its habitat; this includes primarily their designated critical habitat and areas within a species' recommended recovery units or other priority recovery areas. Projects located outside of listed-species habitats, or projects that have no effect on federally-listed species or their habitats, do not need to consult with the Service under section 7 of the ESA.

This PBA applies immediately to all projects described in Section 3 of this document that have been proposed for funding by FEMA under all open declared rain, flood, fire, earthquake, and wind disasters in California. Open declared disasters are defined as disasters for which FEMA is still providing federal assistance under the Stafford Act. This PBA also applies to pre-disaster hazard mitigation projects for which FEMA funding has been requested.

This PBA covers only projects of a permanent nature; projects intended to restore damaged facilities or to prevent future damage through mitigating activities such as vegetation management. **It does not cover emergency response actions.** As described in federal regulations at 50 CFR Part 402.05, the term "emergency circumstances…applies to situations involving acts of God, disasters, casualties, national defense or security emergencies," and includes response activities that must be taken to prevent imminent loss of human life or property. During an emergency response action, FEMA will call the Service for technical assistance on effects to federally-listed species. FEMA will then initiate consultation with the Service on emergency response activities as soon as practicable, unless another method is determined to be sufficient by the Service.

The analysis in this PBA has relied upon FEMA's historic experience of project typology, description, and consequences described in environmental documents from 1994 to 2005. Analysis in this PBA is also based on review of scientific literature and other available information about federally-listed species, consultation with regulatory agency personnel, and expert opinions.

This PBA, and the subsequent ESA Section 7 programmatic consultations, cover only projects for which FEMA acts as the lead federal agency. In order to avoid duplication of efforts, FEMA will not seek compliance under the ESA for minor, in-kind projects (referred to as "small projects" in the January 2000 letter of agreement between the U.S. Army Corps of Engineers (Corps) and FEMA (Attachment 1)) where the Corps acts as the lead agency, or for projects completely within the Corps jurisdiction that repair areas to pre-disaster conditions. These projects are subject to review and permitting by the Corps under the Clean Water Act and are, therefore, subject to review and compliance under the ESA. For FEMA-funded projects with a Corps nexus, compliance under the ESA would be completed by the Corps with the Service prior to the FEMA action being initiated.

2.3 USE OF THE DOCUMENT

This document is intended to be used in a "stepped-down" fashion; meaning that projects that fall into a higher ESA determination category (*e.g.*, likely to adversely affect) may be re-categorized to a more species-friendly category (*e.g.*, not likely to adversely affect) based on 1) revisions to a project's scope of work, timing, or duration; 2) implementation of appropriate general and species-specific conservation measures as outlined in the appendices of this document; or 3) implementation of advice or recommendations received from consulting biologists and on-site Service-approved biological monitors. As an added step, FEMA may chose to contact the appropriate jurisdictional Service Field Office informally in an effort to

assist project proponents in re-designing their projects prior to the need for FEMA to initiate formal ESA section 7 consultation.

Additionally, this document is intended to be used in its entirety; meaning that the individual sections, appendices, or bullet items within an appendix are not intended to stand alone, they are intended to be used in concert with the rest of the document. Using the document as a whole, rather than in part, provides the maximum amount of protection to federally listed species and their habitats while providing the greatest amount of flexibility to the project proponents.

Theoretically, all FEMA-funded projects could get to a "not likely to adversely affect" ESA determination by making the changes listed above or by implementing the conservation measures as described in this document's appendices. This may, however, not be practicable or feasible for some projects based on site specific conditions or other constraints. In those instances, incidental take for federally listed species addressed in this document may be authorized through the programmatic consultation process. In other cases, the Service will determine that projects clearly do not meet the criteria outlined throughout this document. In those cases, FEMA will have to initiate individual ESA section 7 consultation with the appropriate jurisdictional Service Field Office prior to project implementation.

2.4 UPDATES AND REVISIONS

At FEMA's discretion, this PBA may apply to subsequent disaster response efforts to be declared by the President, when FEMA so notifies the participating interested public and government parties and agencies. **If FEMA chooses to use this PBA for future disasters, FEMA will update the document, if needed, and in cooperation with the Service, update any programmatic consultations that resulted from this PBA, as necessary.** For example, if new California counties are included in subsequent disasters where other species occur that were not previously addressed, or if new species are listed or new critical habitats designated, or the scope of FEMA's actions change; FEMA will address these issues in a new PBA or in an amendment to this PBA, and they will re-initiate consultation with the Service in accordance to 50 CFR Part 402. FEMA will ensure that this PBA, and the resulting programmatic consultation documents, are revised and updated at a minimum of at least every five years from the date that consultation is completed.

3.1 ACTION AREA

The actions described in this PBA may occur in several counties within the State of California. The heavy 2005/2006 winter rains in California resulted in two federal disaster declarations 9FEMA-1628-DR-Ca and FEMA-1646-DR-CA) in many northern California counties (Exhibit 1a and 1b). Currently, there are more than 150 federally-listed or candidate species and their habitats that could be affected by FEMA-funded actions within those 35 counties (Appendix A). Subsequent federally-declared disasters may occur in other California counties where these species also occur. If this happens, FEMA may chose to expand the action area to include these new counties and then use this PBA and the subsequent programmatic consultation documents (as discussed previously in Section 2.3) to implement their federal disaster assistance programs in those new counties. For example, during the next federally-declared disaster, Stanislaus and Calaveras counties may be included in the disaster. If this were to occur, most or all of the species and the FEMA-funded actions that may have an effect on those species and their habitats have already been addressed in this PBA.

Specific project locations, footprints, affected areas, *etc.* are defined for each project prior to the project proponent receiving federal funds.

3.2 PROPOSED ACTION

This section describes typical projects that are funded by FEMA in response to, or in preparation for, disasters. Projects are described independent of the FEMA program that is the source of funding. Only actions with the potential to affect federally-listed species or their habitats are covered in this PBA. Projects that do not follow all of the guidelines, criteria, assumptions, or intent of this document may not be covered under the Service's programmatic consultations.

Typically recurring actions covered by this PBA include:

- Non-emergency debris removal;
- Constructing, modifying, or relocating facilities;
- Projects involving water courses and coastal features;
- Vegetation management

These project types are described in more detail below.

3.2.1 NON-EMERGENCY DEBRIS REMOVAL

There are situations where debris removal is necessary in non-emergency situations, such as in the restoration of facilities. Sediment and debris removal projects include:

- Removal of rock, silt, sediment, or woody debris that has been deposited by floodwaters in 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;
- Removal of woody debris from public areas or facilities, such as roads, railroad tracks, and trails following wind or fire events that damage or destroy trees;
- Removal of rock and earth from public areas or facilities following landslides caused by earthquakes or heavy rains; and
- Removal of building rubble from public areas or facilities following earthquakes.

All removable debris would be disposed of at approved and licensed disposal sites, in compliance with existing laws and regulations. Any hazardous materials or other contaminants would be removed and disposed of in an appropriate manner. Many materials may be recycled, if recycling facilities exist.

3.2.2 CONSTRUCTING, MODIFYING OR RELOCATING FACILITIES

FEMA may provide funds for:

- Upgrading or otherwise modifying buildings;
- 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;
- Extending the pressurized water service area; and
- Developing demonstration projects.

These project types are described in more detail below.

3.2.2.1 UPGRADING OR OTHERWISE MODIFYING BUILDINGS

Under this action, FEMA would provide funds to implement changes required by current building codes and standards or otherwise modify existing buildings. Often, these changes have the effect of making the structure more resistant to damage in future events. Typical activities include:

- Making buildings more fire resistant (*e.g.*, by replacing roofs and doors with fire-resistant materials) or safer during fires (*e.g.*, by installing sprinkler and alarm systems);
- Installing bracing, shear panels, shear walls, anchors, or other features so that buildings are better able to withstand earthquake shaking or high wind loads;
- Modifying buildings to reduce the risk of damage during floods by elevating structures above the expected flood level or by flood-proofing;
- Modifying buildings to meet another need of a sub-grantee, such as with an improved action or an alternate action.

If a building is located in an identified floodplain and is substantially damaged, the NFIA requires that the building be elevated so that the lowest floor is at or above the base flood (100-year) elevation. Newly constructed buildings, such as those built to replace destroyed facilities must also meet this requirement, if located in floodplains. Structures can be elevated on extended foundation walls, piers, posts, columns, or compacted fill. All materials used below the base flood elevation must be flood resistant. Utilities, such as exterior compressors, also must be elevated above the base flood elevation. A building also can be flood-proofed so that floodwaters can encounter it without causing damage to the structure or its contents. "Dry flood-proofing" methods involve the installation of flood shields, water-tight doors and windows, earthen barriers, and pumping systems to prevent water from entering the structure. "Wet flood-proofing" involves the installation of vents and flood-resistant materials so that water may enter and leave areas of the structure without causing damage. With both dry and wet flood-proofing, utilities are modified, elevated, or relocated to prevent floodwaters from accumulating within them. Buildings also may be upgraded to meet codes unrelated to damage from natural hazards, such as upgrades required by changes in capacity or function, and upgrades necessary to meet the requirements of the Americans with Disabilities Act.

3.2.2.2 PROVIDING TEMPORARY FACILITIES

FEMA may provide temporary group housing sites when a disaster renders homes uninhabitable for long periods. Such sites are typically constructed using travel trailers or manufactured housing. Typical activities include:

- 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 proper street lighting), telephones lines, *etc.*

These actions would be implemented only if other housing options, such as vacancies in hotel rooms or availability of rental units, are not feasible. Appropriate sites are not to be located in a floodplain, contain wetlands, critical habitat, or other sensitive areas, affect historic properties or archaeological sites, or contain hazardous materials.

Installation of housing units and utilities is accomplished in accordance with current codes and standards. After temporary housing is no longer needed at the disaster site, the temporary housing units and associated ancillary facilities are removed and the land is restored to its original use. All removed materials are stored for future use or disposed of in accordance with applicable laws and regulations.

FEMA may also provide funding for temporary relocation of essential public services, in the event that the structures housing those services are damaged, destroyed, or otherwise rendered inaccessible by a disaster. In most cases, the lease or purchase of facilities is eligible; however, construction of new facilities may be eligible if this action is also cost-effective. Funds also are provided for the upgrades necessary to meet current codes and standards and the installation or modification of appurtenances necessary to operate facilities, such as utilities.

3.2.2.3 ACQUIRING AND DEMOLISHING EXISTING FACILITIES

FEMA may provide funds for the acquisition and demolition of existing facilities 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. Generally, a local government entity purchases private properties on a willing-seller basis; once the property has been purchased, the existing facilities are either removed or demolished and the property will be dedicated and maintained in perpetuity for uses compatible with open space, recreational, or wetlands management practices, pursuant to 44 CFR 206.434(d). All demolition materials are disposed of at approved and licensed disposal sites, in compliance with applicable laws and regulations, and any hazardous materials or other contaminants are 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 are graded to conform to the local topography and disturbed areas are re-vegetated with species approved for the local area. Frequently, the local government will develop the acquired land for recreational or open-space uses, such as parks, athletic fields, or walking and bike trails.

3.2.2.4 REPAIRING, REALIGNING, OR OTHERWISE MODIFYING ROADS, TRAILS, UTILITIES, AND RAIL LINES

Roads, trails, utilities, and rail lines are typically damaged when floods, heavy rains, earthquakes or other natural or man-made disasters occur to cause erosion, subsidence, or landslides. 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. It may be necessary to stabilize the replacement fill using rock, grout, timber walls, or steel sheet piling. Hazard mitigation measures may be installed to prevent 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 also may be modified as part of improved actions or alternate actions to meet additional needs of the sub-grantee.

3.2.2.5 CONSTRUCTING NEW FACILITIES OR RELOCATING EXISTING FACILITIES

If a facility is located in a floodplain or other hazard 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. Examples of this type of action include construction of buildings, roads, trails, utilities and utility lines, and rail lines in a different area from the existing facility. The physical relocation of existing facilities is only practical with buildings. In cases of 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 would fund the acquisition of damaged properties, demolition of existing structures (except in cases of physical relocation), and the placement of deed restrictions that would limit future uses to open space in perpetuity. New facilities (including buildings, roads, trails, utilities and utility lines, and rail lines) also may be constructed as improved actions or alternate actions to meet additional needs of the sub-grantee.

3.2.2.6 RELOCATING THE FUNCTION OF AN EXISTING FACILITY

Under this action, FEMA would fund the relocation of the function of a facility to an existing facility that has adequate capacity to handle the additional load with minor modifications, if any. For structures, the occupants and materials would be relocated to alternative structures, traffic would use alternate routes, and utility services would be provided by alternative methods. This action would not entail any major physical construction or addition to the existing facility and, if any work would be required, it would consist of only minor modifications. A typical example is transferring students from a damaged or flood-prone school to a suitable existing school nearby, if feasible in terms of capacity and convenience for students, families, and teachers. For properties in a hazard area, FEMA would fund the acquisition of damaged properties, demolition of existing structures, and the placement of deed restrictions that would limit future uses to open space in perpetuity

3.2.2.7 Extending the Pressurized Water Service Area

As a means of preventing future damage during wildfires, FEMA may fund the extension of pressurized pipelines to a developed area that is prone to repetitive fire damage. Under this action, an existing, pressurized system is extended so that fire hydrants can be installed in the area where damage is likely to occur. Installation, which involves excavation, is typically completed within the road right-of-way.

3.2.2.8 Developing Demonstration Projects

Demonstration projects focus on public education and are designed to highlight procedures that can be employed by the public to reduce property damage during flood, fire, wind, and earthquake disasters. Potential demonstration projects would involve the development of a model facility to demonstrate how hazard mitigation technologies can be used to reduce the potential damage during a disaster. Flood demonstration projects would involve items such as

elevating a structure or waterproofing windows and doors that are below the elevation of the 100-year flood event. A fire demonstration project would include vegetation management around a facility and/or replacing roofs, doors, and windows with fire-resistant materials. Wind and earthquake demonstration projects would include changes to the structural design of buildings to allow them to withstand higher wind velocity or more movement during an earthquake.

3.2.3 PROJECTS INVOLVING WATERCOURSES AND COASTAL FEATURES

These projects may involve any inland watercourse such as streams, creeks, rivers, lakes, sloughs, bayous, *etc.* It also may involve ponds, vernal pools, and other wetlands that may be perennial (year-round), ephemeral (may be dry during a portion of the year), or intermittent (wet only during an actual rain event). Coastal features may include estuaries, lagoons, harbors, and beaches. All projects would employ standardized Best Management Practices (BMP's) per state water quality standards and criteria, the California Stormwater Best Management Practice Handbooks, *etc.* in order to reduce soil erosion and prevent or reduce the amount of sediment entering the water course. All BMPs would comply with all state, federal, and local jurisdictional laws and requirements. All projects would comply with the guidelines, criteria, assumptions, and intent described in this PBA.

3.2.3.1 Repair, Stabilize or Armor Embankments

These projects would involve the repair of earthen or rock embankments damaged by floodwaters. Examples include natural stream banks (such as those in parks); road, trail, and rail line embankments; embankments for irrigation and navigation canals; and levees used for flood control and reclamation. In addition to the 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:

- Bioengineering techniques, such as planting vegetation, placing root wads or willow (*Salix* sp.) bundles, *etc.* (Appendix D);
- Placement of rock riprap;
- Installation of retaining walls, geotextile fabrics, armorflex®, gabions, *etc.*;
- Hardening with concrete or soil cement.

Any combination of these techniques may be employed; for example, rock and geotextile fabrics, when used with root wads and willow bundles, may provide mitigation from erosion while enhancing the natural values of the stream corridor.

3.2.3.2 Create, Widen, or Dredge a Waterway

These projects are employed to reduce the flood hazard to adjacent lands, facilities, or populated areas. Projects may include:

- Construction of new channels to convey excess flows around flood-prone areas during flood events. Drainage swales, earthen channels, concrete channels, or sub-surface concrete pipes may be used as a means of water conveyance. The channel is constructed in a dry environment and connected to the stream after the channel has been completed. The channel may have an inlet weir that is higher than the elevation of the normal flow so that 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 the channel to convey a larger volume of water. Conveyance also may be increased by replacing earthen banks or channel bottoms with concrete. To the extent possible, the construction would be conducted from the top of the bank. In perennial streams, work in a stream channel would generally be restricted to the low-flow period.

- 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 alternative is often 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. Sediment and debris may be removed by dredging, through the use of heavy equipment, or by hand. All removed debris would be disposed of in compliance with existing laws and regulations.

3.2.3.3 Construct or Modify a Water Crossing

Water crossings, such as culverts and bridges, can be eroded or entirely washed away by high stream flows, heavy rains, or storm-driven waves. Wind, earthquakes, or fire events may cause structural damage to bridges or culverts. FEMA may fund the repair or replacement of damaged water crossings; enlargement of openings to allow greater water conveyance and to reduce debris accumulation during floods; or the installation of bank protection and other means to reduce the risk of erosion. The capacity of a culvert crossing may be increased to reduce the risk of flooding to the surrounding area; the culvert may be modified to prevent overtopping or erosion of the crossing; or a bridge may be installed to replace a culvert as a means of increasing the flow capacity of a crossing. Culverts may consist of corrugated metal pipes, reinforced concrete pipes, and reinforced concrete box culverts, or other materials. Crossings also may be relocated to avoid high hazard areas, repetitive damage, or areas where reconstruction is not cost effective or is not feasible. Typical projects include:

- Increasing the size of a culvert, or adding additional culverts;
- Hanging the type of culvert;
- Changing the location or alignment of the culvert; and
- Adding features, such as a headwall, discharge apron, or riprap, to reduce the risk of erosion or damage to the culvert or the crossing.

Destroyed bridges are replaced according to standard building and seismic safety codes. Bridges may be modified to increase channel capacity, thus reducing the risk of flooding, or to reduce the risk of damage to the crossing. Typical projects include:

- Widening of existing openings, or construction of new openings;
- Reconfiguration of bracing to reduce the risk that debris will be trapped;
- Installation of protective features, such as concrete abutments or riprap, to reduce the risk of damage due to erosion and scour; and
- Replacement of a multi-span structure with a clear-span structure.

3.2.3.4 Construct or Modify a Water Detention, Retention, or Storage Facility

These projects include the construction, enlargement, or restoration of detention basins, retention basins, sediment ponds, and reservoirs 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 would be most frequently associated with flood disasters, and to a lesser extent fire disasters. Detention dams, retention dams, and sediment ponds would be constructed routinely to temporarily store flood flows so that downstream peak flows would be reduced. The stored water would be released at a slower rate so that the existing conveyances can convey the water without contributing to downstream flooding. Frequently in rural areas, fire fighting is heavily constrained by the lack of water that can be used by firefighters. In response to this need, proposed actions also may include the creation of retention dams in locations that can be readily accessed by firefighters either as a direct source of water or as a source of water to fill their water supply trucks. These projects also may include the repair or restoration of water retention and detention structures and sediment ponds.

3.2.3.5 Construct or Modify Other Flood Control Structures

A flood control structure is a facility designed to prevent floodwaters from entering a flood-prone area. Typical examples include levees (also referred to as dikes) and floodwalls. These may be damaged by high water from floods, storm driven waves, and structural damage from earthquakes. Projects typically include:

- Repairing damaged facilities, usually during emergency situations;
- Installing embankment protection, as described above;
- 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 are repaired or constructed using compacted fill and, in some cases, geotextile fabric and riprap protection at the base. Typically, a gravel road is installed on the crest of the levee to allow for maintenance. Floodwalls, usually built in urban areas, are constructed using reinforced concrete or grouted and/or reinforced concrete block. Excavation is necessary to install footings. Both types of facilities may include interior drainage systems that may include pumps for removing accumulated water. Bare earth is often seeded with grasses to prevent erosion.

3.2.3.6 Construct or Modify a Coastal Feature

These projects include the repair, replacement, or construction of facilities in coastal environments, such as estuaries, bays, inlets, harbors, and beaches. These facilities typically 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 generally occur in the water and typically involve driving piles, placing rock or soil, or dredging sand, mud, or other sediment. Minor improvements to meet current building and safety codes, or to prevent future damage in disasters, also may be funded.

3.2.4 VEGETATION MANAGEMENT

Vegetation management is employed to reduce the risk of wildfire and to increase the ability of channels to convey flows, thus reducing the risk of flood damage. These projects may be accomplished using mechanical means, hand clearing, managed animal grazing, application of herbicides, or through the use of prescribed fire. Some projects may include combinations of these methods.

3.2.4.1 Mechanical or Hand-Clearing of Vegetation

This action would involve construction, expansion, and/or maintenance of fuel breaks and fuel reduction zones. For the purpose of this document, fuel breaks are corridors where all woody vegetation has been removed. The purpose of a fuel break would be to reduce the extent of fire and to provide a location in which firefighters can work safely and effectively. Fuel breaks also can be compacted or graded for use as fire access roads.

Fuel reduction zones reduce the speed at which a fire spreads and creates a safer environment for firefighters. Mechanical removal would use heavy equipment that can uproot, crush, pulverize, or cut the trees and brush to be removed. Hand removal would involve the use of chainsaws, axes, and hoes to cut and uproot vegetation. Vegetation downed as a result of mechanical or hand removal would be piled and burned on site, chipped and spread on site, or loaded and hauled from the site. After the removal of the targeted vegetation, cleared areas may be re-vegetated with native fire-resistant species. The project proponent (*i.e.*, the sub-grantee) would be responsible for the maintenance of created fuel breaks and fuel-reduction zones. On occasion, mechanical and/or hand removal of vegetation may be employed around a much larger area that has been targeted for a prescribed fire to reduce the potential that the set fire will escape from the burn area.

3.2.4.2 Herbicidal Treatments

Only registered chemicals will be used to control the growth of undesired vegetation. Only chemicals approved for aquatic use would be used in or near aquatic environments. A registered pesticide applicator will apply all such chemicals that require an applicator's license. After treatment, some areas may be re-vegetated with locally occurring, native vegetation that is fire resistant. Actions generally associated with herbicidal treatment of vegetation include the removal of targeted exotic invasive species within specific areas (*e.g.*, *Eucalyptus* sp.) and the prevention of growth and re-sprouting of undesirable vegetation (*e.g.*, *Baccharis* sp.) once an area has been cleared of excessive vegetation by mechanical removal, hand removal, and/or prescribed fires.

Regulations at 50 CFR Part 402.04 provide that ''the consultation procedures may be superseded for a particular Federal agency by joint counterpart regulations among that agency, the Fish and Wildlife Service, and the National Marine Fisheries Service (NMFS)." The Service, in cooperation with NMFS and the Environmental Protection Agency (EPA), have published Joint Counterpart Regulations that govern the ESA section 7 consultation process for the use of pesticides in or near federally-listed species and their habitats (69 **FR** 47732).

FEMA will defer to the consultation procedures as described in 69 **FR** 47732 for all projects involving the use of registered pesticides (*i.e.*, if it is already approved for use in federally-listed species habitats per the process set forth in the Joint Counterpart Regulations, no additional section 7 consultation will be initiated). Exceptions to this include all projects that occur in areas within the known range and/or habitat of federally-listed species deemed to be "critically" endangered due to their current population numbers and distributions (*e.g.*, Solano grass (*Tuctoria mucronata*), showy Indian clover (*Trifolium amoenum*), Baker's larkspur (*Delphinium bakeri*), *etc.*) (Identified in Appendix A under "status" column as an E with and asterisk [E*]).

FEMA will initiate individual ESA section 7 consultation with the Service in all such cases because the risk of extinction due to pesticide use in and around "critically" endangered species such as these is extremely high and, therefore, may result in jeopardizing the continued existence of the species. In these cases, the Joint Counterpart Regulations also require the initiation of section 7 consultations with the Service.

3.2.4.3 Prescribed Fire

Prescribed fires would be used in areas with high fire-hazard potential exists due to the amount of fuel available in the environment. The intent of a prescribed fire is to systematically reduce the amount of fuel in a controlled manner, thereby reducing the duration and intensity of wildfires. This is similar to the discussion above about fuel-reduction zones, except that the treatment area is typically larger. Prescribed fires would require interagency coordination by the project proponent to ensure that all appropriate federal, state, and local agencies have been notified of the action, that all laws and regulations have been fulfilled, and that standardized safety and implementation protocols, and other concerns, have been addressed. FEMA also requires that the applicant follow the burn procedures outlined in the most recently available edition of the California Environmental Protection Agency's *Forest Management Burning Handbook*. As discussed previously, prescribed fire projects frequently would be combined with mechanical and/or hand removal of vegetation around the perimeter of the proposed burn area to help ensure that a fire is controlled and contained within the prescribed area. Prescribed fire actions also may include the burning of trees and brush that have been piled as the result of mechanical and/or hand removal activities. The burning of these piles may require a burn plan, permits, and interagency coordination prior to implementation.

3.2.4.4 Biological Control

Under this action, the project proponent would allow cattle, horses, goats, sheep, or other livestock to graze on vegetation as a means of control. The type of animals, timing, duration, and stocking rate would be selected based on the targets (*i.e.*, the quantity and quality of residue to remain) of an approved vegetation management plan. The project proponent would fence the area proposed for grazing so that the animals would not graze outside of the proposed area. Fences that are appropriate to the target species (*i.e.*, 5-strand barbed wire for cattle; temporary electric fencing for goats, *etc.*) would be installed and a buffer fence located a minimum of approximately 100 feet from the center of all streams, creeks, and rivers would be provided to control grazing animals from permanently damaging the channel and riparian vegetation. This buffer fencing would have gated access points to allow the grazing manager to systematically rotate the animals through the riparian area to better manage the streamside vegetation.

Appropriately spaced and sized water gaps also may be included in the buffer fencing to allow animals to access water *ad libidum*. In cases where ponds and other water sources support known populations of federally-listed species, fences with gates would be installed around these areas in order to control the stocking rate, timing, and duration of the grazing at a level that does not adversely affect the species.

4.1 THREATENED AND ENDANGERED SPECIES

Threatened and endangered species have undergone major population declines as a result of human-induced factors that intensify the adverse effects of natural environmental stochastic events. Well-distributed populations, within an unfragmented or degraded habitat, with high numbers of individuals that are secure from the threats of genetic, demographic, and normal environmental uncertainties, help to eliminate the possibility of species extinctions (Mangel and Tier 1994, Meffe and Carroll 1994, National Research Council 1995, Tear *et al*. 1993). In general, the goal for listed-species survival and recovery is to have a larger number of populations and a larger size of each population so that there is a lower probability of extinction (Hanski *et al.* 2002, Matthies *et al.* 2004, Meffe and Carroll 1994). This basic conservation principle of population redundancy applies to all listed species.

All habitats in California support federally-listed species; the most prominent include uplands, forests, riparian, and wetlands. These habitats support federally-listed species by providing breeding, feeding, and sheltering areas necessary for those species survival. For example, federally-listed reptiles and amphibians, such as the San Francisco garter snake (*Thamnophis sirtalis tetrataenia*) and the California tiger salamander (*Ambystoma californiense*), use upland hibernacula and aestivation areas that are adjacent to breeding/foraging ponds and wetlands; threatened butterflies, such as the bay checkerspot (*Euphydryas editha bayensis*) and the callippe silverspot (*Speyeria callippe callippe*), use uplands as breeding, foraging, and dispersal habitat and their larvae use very specific host plants, such as V*iola pedunculata* and *Plantago erecta,* found only within these fragmented upland landscapes. The least Bell's vireo (*Vireo bellii pusillus*) and the western yellow-billed cuckoo (*Coccycus americanus)* use riparian areas almost exclusively for their breeding and foraging needs, while spotted owls (*Strix occidentalis* ssp.) and marbled murrelets (*Brachyramphus marmoratus*) breed and forage within stands dominated by redwood (S*equoia sempervirens*) and Douglas fir trees (*Pseudotsuga menziesii* var. *menziesii*).

While FEMA's role in a federally-declared disaster is to provide necessary funding to disaster-assistance applicants, it is also their mandate from the U.S. Congress to use their authority for furthering the purposes of the ESA (Section 7(a)(1)). To the maximum extent practicable, FEMA will ensure that habitat which is critical for the long-term recovery and conservation of federally-listed species is not further lost, degraded, or destroyed as a result of FEMA-funded projects by ensuring that all funding recipients follow the criteria, guidelines, assumptions, and intent of this PBA and the subsequent programmatic ESA section 7 consultation documents.

4.1.1 ENDANGERED SPECIES ACT DEFINITIONS

The term "**take**" is defined in section 3 of the ESA as "to harass, harm, pursue, hunt, shoot, wound, kill, capture, or collect, or to attempt to engage in any such conduct."

The term "**harass**" in the definition of "take" in the ESA is defined 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 (50 CFR Part 17.3(c)).

The term "**harm**" in the definition of "take" in the ESA is defined as an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering (50 CFR Part 17.3(c)).

The term "**critical habitat**" is defined in section 3 of the ESA for a threatened or endangered species to mean: "(i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the ESA, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time is it listed in accordance with the provisions of section 4 of the ESA, upon a determination by the Secretary that such areas are essential for the conservation of the species." (ESA Section 3 (5)(A)).

The term "**direct effect**" is defined as the direct or immediate effects of the project on the species or its habitat. Direct effects result from the action including the effects of interrelated actions and interdependent actions. Interrelated actions are actions that are no part of a larger action and depend on the larger action for their justification. Interdependent actions are actions having no independent utility apart from the proposed action (50 CFR Part 402.02)

The term "**indirect effect**" are those effects that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 CFR Part 402.02).

The term "**adverse modification**" is defined as "a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical" (50 CFR Part 402.02).

4.1.2 CRITICAL HABITAT

Critical habitat identifies those areas that require protection or special management to provide for the recovery of federally listed species. To be included in a critical habitat designation, the habitat must first be essential to the conservation of the species. Critical habitat designations identify, to the extent known using the best scientific and commercial data available, habitat areas that provide essential life cycle needs of the species (*i.e.*, areas on which are found the Primary Constituent Elements (PCEs), as defined at 50 CFR Part 424.12(b)). Regulations found at 50 CFR Part 424.12(e) states "the Secretary shall designate as critical habitat areas outside the geographic area presently occupied by the species only when a designation limited to its present range would be inadequate to ensure the conservation of the species. " Accordingly, when the best available scientific and commercial data do not demonstrate that the conservation needs of the species so require, the Service will not designate critical habitat in areas outside the geographic area occupied by the species. The Service may exclude areas from critical habitat designation when the benefits of exclusion (*e.g.*, economic impact, impacts to national security, and any other relevant impact) outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Critical habitat receives protection under section 7 of the ESA through the prohibition against destruction or adverse modification of critical habitat with regard to actions authorized, funded, or carried out by a Federal agency. Section 7 of the ESA also requires conferences on Federal actions that are likely to result in the destruction or adverse modification of proposed critical habitat. Aside from the added protection that may be provided under section 7, the ESA does not provide other forms of protection to lands designated as critical habitat. Because consultation under section 7 of the ESA does not apply to activities on private or other non-Federal lands that do not involve a Federal nexus, critical habitat designation does not afford any additional regulatory protections under the ESA against such activities. Critical habitat designations do not signal that habitat outside the designation is unimportant to federally listed species. Areas outside the critical habitat designation will continue to be subject to conservation actions that may be implemented under section 7(a)(1), and to the regulatory protections afforded by the section 7(a)(2) jeopardy standard and the section 9 take prohibition, as determined on the basis of the best available information at the time of the action.

In accordance with section 3(5)(A)(i) of the ESA and regulations at 50 CFR Part 424.12, in determining which areas to propose as critical habitat, the Service must consider those physical and biological features (Primary Constituent Elements, PCEs) that are essential to the conservation of the species, and that may require special management considerations or protection. These include, but are not limited to: space for individual and population growth, and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, and rearing of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species. The PCEs that are essential to the conservation of the federally listed species addressed in this PBA are found in Appendix E of this document.

4.1.3 ESTIMATED INCIDENTAL TAKE AND DESTRUCTION AND ADVERSE MODIFICATION OF CRITICAL HABITAT

FEMA anticipates that their federally funded projects may, at times, result in the incidental injury or death of individuals of some federally listed species addressed in this PBA. However, FEMA anticipates that incidental take of the species will be difficult, if not impossible, to detect at any given project site because there have been no formal surveys for most species or habitats in areas where projects are likely to occur; some species are very small and secretive, or they occur in habitats that make detections difficult (*i.e.*, turbid water, dense cover, high canopy, underground burrows, and cryptic coloration), thereby making them nearly impossible to locate during survey efforts; finding a dead or injured species is unlikely within a project activity area; and/or mortality may be masked by seasonal fluctuations in numbers or other causes (*e.g.*, oxygen depletions for aquatic species, migration and hibernation of terrestrial species, *etc.*). Therefore, it is not possible to make an accurate estimate of the number of individuals of federally listed species that will be injured or killed. FEMA assumes, however, that the implementation of all of the proposed conservation measures in Appendices B & C will minimize to the absolute maximum extent practicable, the amount of injury and mortality to federally listed species at or near a FEMA-funded project site. It is also assumed that all federally listed species at or near a FEMA-funded project location may be harassed, at least temporarily during project activities even though all general and species-specific conservation measures are implemented by the project proponent.

In instances where incidental take is difficult to detect, the Service generally estimates the amount of incidental take in terms of the number of acres of habitat affected as a result of the action. Using this precedence, **FEMA is anticipating that not more than one (1) acre of actual habitat will be affected at any given project site. This one (1) acre of actual habitat will not represent more than five percent (5%) of the number of individuals or habitat of any population or colony, or five percent (5%) of the entire range or population of a federally listed species.** This estimate is for actual federally-listed species habitat that is "appreciably diminished" in its conservation value and it includes all activities associated with the federally funded project (*e.g.*, staging areas, borrow sites, parking areas, routes of ingress and egress, *etc.*). This estimate does not include non-habitat areas. For example, FEMA may fund the repair and re-graveling of ten miles of road surface; since the work is completed wholly within the roadway right-of-way with all general and species-specific conservation measures implemented, as appropriate, no actual habitat is estimated to be affected. Another example may be the repair or replacement of a culvert where the work is completed wholly from the roadway; in this example, only habitat that is immediately adjacent to the culvert is affected and counted as part of the estimate.

FEMA anticipates that out of an estimated 5,400 potential projects that will request federal assistance in response to the FEMA-1628-DR-CA and FEMA-1646-DR-CA disaster declarations that **not more than a cumulative total of 900 acres of actual habitat for the more than 150 federally listed species in all 35 counties declared under these disasters will be affected as a result of the proposed programmatic action.** This estimate is based on the assumption that approximately 900 projects will require environmental review to ensure compliance with the ESA. This estimate does not include projects valued at less than $57,500 that will be sent to the U.S. Army Corps of Engineers per the agreement found in Attachment 1 of this document. The corps will address the section 7 issues associated with those projects per their own guidelines. As such, no more than a maximum of 900 FEMA projects could result in a maximum of one (1) acre of adverse effects to the habitat for a total of 900 acres. FEMA believes, based on these estimates, that designated or proposed critical habitat will not be appreciably diminished (*i.e.,* to a noticeable or measurable degree) in its value towards the conservation of federally listed species affected by the proposed actions. Therefore, no federally listed species existence will be jeopardized and no destruction or adverse modification of designated or proposed critical habitat will occur when all of the proposed general and species-specific conservation measures found in Appendices B & C are implemented.

FEMA will initiate individual consultation on all projects where more than one (1) acre of actual habitat may be directly or indirectly affected and/or where more than five percent (5%) of the number of individuals or habitat of any population or colony, or five percent (5%) of the entire range or population of a federally listed species, will be adversely affected.

4.1.4 CRITICALLY ENDANGERED SPECIES

The Service believes there are certain federally listed species that require additional protective measures in order to ensure that these species do not become extinct in the immediate foreseeable future; these species are referred to as "critically" endangered species in this document. This designation includes species with only one remaining known population, species that are currently being raised in captivity for future reintroduction efforts, species that are designated by the State of California to be "State Fully Protected" species, species with very small population sizes such that there survival and recovery is questionable due to factors such as inbreeding and deleterious genetic outcomes, and other "special status" species as determined by the Service. "Critically" endangered species are indicated in Appendix A under the "status" column as an 'E' with an asterisk (E*).

FEMA will initiate individual ESA section 7 consultations with the Service for all projects that are likely to adversely affect "critically" endangered species due to their extreme risk of extinction.

5.1 EVALUATION OF TYPICAL RECURRING ACTIONS

The actions funded by FEMA during disaster response efforts are not intended to adversely affect federally-listed species or their habitats. However, any activity that involves work in an area with federally-listed species, no matter what the intent, has the potential to negatively affect those resources without careful planning.

The proposed actions discussed previously in this PBA may affect threatened and endangered species by disturbing the breeding, feeding, mating, and sheltering of these species. These affects may be direct or indirect, and either temporary or permanent. Effects that may occur as a result of the actions described in this PBA include the direct or indirect disturbance, modification, or destruction of habitat such that it results in the death, injury, or harassment of individuals or populations of listed species, or impedes or prevents the dispersal of individuals or populations of listed species. For example, earthmoving activities conducted in snake or salamander habitat can directly kill or injure individuals by crushing them under heavy equipment or by burying them alive within a burrow system; the replacement of culverts can indirectly impact vernal pools and their obligate invertebrate and plant species by altering the hydrology of the locally-contributing watershed; or the replacement of bridge pilings can indirectly cause nesting marbled murrelets and spotted owls to abandon their nesting efforts due to excessive noise levels within the breeding habitat.

FEMA is proposing both general conservation measures (Appendix B) and species-specific conservation measures (Appendix C) in order to prevent adverse effects to federally-listed species and their habitats to the maximum extent practicable while still accomplishing their disaster response mission.

Specific actions that adversely affect listed species may include, but are not limited to:

- temporary or permanent loss, fragmentation, and degradation of habitat; *e.g.*, earthmoving activities that directly kill or injure an individual; or the removal or modification of the overstory canopy such that it indirectly affects a species through increased downstream water temperatures;

- increasing the amount of debris or pollutants in the habitat; *e.g.*, type, use, or placement of construction material within a stream that supports frogs or fish; spills and/or runoff of construction equipment fuel, *etc.*;

- increasing the amount of sedimentation in the water; *e.g.*, erosion from improperly maintained sediment control devices, *etc.*; and

? withdrawing, de-watering, diverting, degrading, or otherwise negatively affecting water flow either upstream or downstream of a project site; *e.g.*, improperly designed stream crossings or diversions, installing coffer dams, *etc.*

In cooperation with the Service, FEMA has identified three categories of typically recurring FEMA-funded projects. These categories are described below.

Category 1—No Effect: Projects having no effect (NE) on the listed species or their habitats. "No effect" is defined as having no measurable or discernable effect to the species or their habitat. Consultation with the Service would not be required when FEMA makes a "no effect" determination.

Category 2—Not likely to adversely affect: Projects not likely to adversely affect (NLAA) listed species or habitat. "Not likely to adversely affect" is defined as having an effect that is insignificant, discountable, or wholly beneficial. For such projects, FEMA would initiate project-specific, ESA section 7 consultations with the Service for all projects not previously covered under a programmatic "not likely to adversely affect" concurrence letter from the Service.

Category 3—Likely to adversely affect: Projects likely to adversely affect (LAA) listed species, and therefore requiring take authority through the issuance of a biological opinion. A determination of "likely to adversely affect" occurs when the action is likely to directly or indirectly have an adverse effect to a listed species or its critical habitat. For such projects, FEMA would initiate project-specific, ESA section 7 consultations with the Service for all projects not covered under a programmatic biological opinion previously issued by the Service.

5.1.1 CATEGORY 1 – NO EFFECT

The actions listed below are determined to have "**no effect"** on federally-listed species or their habitats provided that they are implemented in a manner that meets the guidelines, criteria, assumptions, and intent as described below and throughout this PBA. It will be incumbent upon FEMA (and their applicants and sub-grantees) to ensure that a decision to proceed with an action determined to have "no effect" on a federally-listed species or their habitats is correctly justified and well documented in order to avoid a possible violation under section 9 of the ESA. Actions determined by FEMA to have "no effect" do not require additional consultation with the Service.

Appendices B & C outline general and species-specific conservation measures that will be adhered to for all actions determined by FEMA to be "no effect" actions.

In general, FEMA considers all actions occurring where there are no known federally-listed species and/or actions occurring outside of federally-listed species' habitats, especially designated critical habitat and/or recommended recovery areas as "no effect" actions. Specific actions and examples that also may be "no effect" actions include:

5.1.1.1 Non-emergency debris removal:

a. Removal of rock, silt, sediment or woody debris as a result of floodwaters, heavy rains, earthquakes, wind storms, fires, or other disasters, from a previously disturbed area with no federally-listed species or where no indirect effects will occur to federally-listed species or their habitats. Examples may include storm-water detention basins, city streets, city parks, residential or commercial lots, creeks, streams, canals, drainages, *etc.* with no federally-listed species or habitats nearby (Exhibit 2);

b. Removal of building rubble and other debris from public areas or facilities following a disaster (*e.g.*, residential and commercial buildings within a city) when those activities occur wholly within a previously disturbed site (such as an urbanized area) with no federally-listed species or habitats nearby (*e.g.*, the debris removal truck can drive to a residential lot on an existing city street);

5.1.1.2 Upgrading or otherwise modifying buildings:

a. Upgrading buildings to meet current codes and standards;

b. Repairing buildings (*e.g.*, replacement of windows, walls, roofing material, *etc.*);

c. Making buildings more fire resistant by replacing roofs and doors with fire-resistant materials;

d. Making buildings safer during fires by installing indoor sprinkler systems and alarms;

e. Installing bracing, shear wall, shear panels, anchors and other features so that building withstand earthquakes, floods, or high wind loads;

f. Flood-proofing buildings or elevating structures above the expected flood level (Exhibit 3);

A project involving fill placement or other ground disturbance activities in an area with federally-listed species or their habitat, in order to elevate or flood-proof a structure adjacent to a watercourse above flood levels is NOT eligible under this category. A project of that nature would be considered under Category 2 or Category 3 below.

g. Modifying buildings to meet another need of the project proponent, such as with an improved action or an alternate action (described previously), provided those actions are confined within a previously disturbed area with no federally-listed species or habitats and have no affect on federally-listed species or their habitats.

5.1.1.3 Providing temporary facilities:

Providing temporary facilities within a previously disturbed area (*i.e.*, within a pre-existing residential or commercial area). For example, constructing pads for dwellings where dwellings previously existed prior to the disaster; constructing, re-constructing, or clearing roads, streets, parking lots, etc. within a city or town where no federally-listed species or habitats occur; installing overhead and underground utilities such as water, sewer, electricity, street lighting, telephone, and cable provided that the installation will have no effect on federally-listed species or their habitats (*e.g.*, non-destructive, trench-less cable installation), and installing fencing (*i.e.*, chain link) for security, control, *etc.*).

5.1.1.4 Acquiring and demolishing existing facilities:

Acquiring and demolishing existing facilities provided that the demolition and hauling of the debris will have no effect on federally-listed species or their habitats (*e.g.*, no new roads will be constructed to access the demolition site).

5.1.1.5 Repairing, realigning, or otherwise modifying roads, trails, utilities, or rail lines:

FEMA will make "no effect" determinations for these types of projects only when the work will be wholly contained within the previously-existing footprint such that no

activity and no direct or indirect effect will occur outside of that footprint and/or there are no federally-listed species or their habitats present (Exhibit 4).

5.1.1.6 Constructing new facilities or relocating existing facilities:

FEMA will make "no effect" determinations for these types of projects only when there are no federally-listed species or their habitats present or when the work will be wholly contained within a previously-disturbed area such that no activity and no direct or indirect effect will occur outside of that area.

5.1.1.7 Relocating the function of an existing facility:

Relocating the function of an existing facility provided that the relocation does not require additional construction of infrastructure (*e.g.*, roads) where federally-listed species or their habitats occur. For example, relocating students from a damaged or flood-prone school to a nearby existing school would be a "no effect" action.

5.1.1.8 Extending the pressurized water service area:

Extending the pressurized water service area provided that the system is not extended into areas where federally-listed species or their habitats occur (*e.g.*, trenching through a population of listed plants to install a fire hydrant).

5.1.1.9 Developing demonstration projects:

Developing demonstration projects for the purposes of public education and outreach, provided that the project does not require an action where federally-listed species or their habitats occur (*e.g.*, building a display or holding a demonstration within listed species habitat).

5.1.1.10 Actions involving watercourses and coastal features:

FEMA anticipates making "may affect" determinations for these types of projects, unless projects occur in an area where no federally-listed species or their habitats occur. Projects include:

a. Repairing, stabilizing, or armoring embankments;

b. Creating, widening, clearing, or dredging a waterway;
c. Constructing or modifying a watercourse crossing;
d. Constructing or modifying a water detention, retention, or storage facilities;
e. Constructing or modifying other flood control structures;
f. Constructing or modifying coastal features.

5.1.1.11 Vegetation management:

a. Biological control of vegetation including the use of sheep, cattle, horses, goats, or other livestock, provided that the timing, duration, and intensity of the grazing is conducted according to an approved vegetation management plan or grazing plan, and it has been determined previously by the Service to be compatible with federally-listed species and their habitats (*i.e.*, is a recommended action in a published recovery plan);

b. Mechanical and/or hand clearing of vegetation may fall under a "no effect" determination if the action is carefully planned and implemented within federally-listed species habitats. FEMA will evaluate each project on a case-by-case basis prior to making a determination;

c. Herbicide treatment: except in the absence of federally-listed species or their habitats, FEMA will not make "no effect" determinations for these types of projects.

5.1.2 CATEGORY 2 - NOT LIKELY TO ADVERSELY AFFECT

The actions listed below are "**not likely to adversely affect"** federally-listed species or their habitats provided that they are implemented in a manner that meets the guidelines, criteria, assumptions, and intent as described below and throughout this PBA. Appendices B & C outline general and species-specific conservation measures that will be followed in their entirety, as applicable, in order to ensure that FEMA-funded projects meet Category 2 requirements. All standardized BMPs, as recommended and/or required by all regulatory agencies such as the state regional water quality and air quality boards, county grading permits, California Department of Fish and Game Code section 1600 Streambed Alteration Agreements, *etc.* also will be implemented to ensure FEMA-funded actions avoid and minimize adverse effects on federally-listed species or their habitats. For projects that initially fall into Category 2, FEMA may choose to work with the Service to modify those projects, on a case by case basis, to achieve a Category 1 "no effect" status, when possible.

Effects that are insignificant, discountable, or wholly beneficial are, by definition, allowable effects under Category 2. It will be incumbent upon FEMA (and their applicants and sub-grantees) to ensure that a decision to proceed with an action determined as "not likely to adversely affect" a federally-listed species or their habitats is correctly justified and well documented in order to avoid a possible violation under section 9 of the ESA.

In order for the actions described below to not adversely affect federally-listed species or their habitats, all work will be conducted in an area, from a location, or in such a manner that it will not directly or indirectly kill or injure a federally-listed species, will not intentionally or negligently harass a federally-listed species to such an extent as to significantly disrupt normal behavioral patterns, and will not negatively affect federally-listed species habitats. Project planning will 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.

Projects that are conducted in the vicinity (*e.g.*, within the same watercourse, within the same city or town, within the same USGS quad, on the same property, or by the same applicant) of other federally-funded actions may not be eligible under Category 2 due to their cumulative or otherwise interrelated and/or interdependent affects on federally-listed species and their habitats. For example, the repair of multiple erosion sites along a canal or creek will have cumulative affects upstream and downstream of each individual project site. FEMA will not make a "not likely to adversely affect" determination on this type of project without further consultation with the Service.

Appendices B & C outline general and species-specific conservation measures that will be adhered to for all actions determined by FEMA to be "not likely to adversely affect" actions. Specific actions may include:

5.1.2.1 Non-emergency debris removal:

a. Removal of rock, silt, sediment or woody debris that has been deposited by floodwaters, heavy rains, earthquakes, wind storms, fires, or other disasters in an area with known federally-listed species or their habitat, but where no federally-listed species will be directly or indirectly killed, injured, or intentionally or negligently harassed to such an extent as to significantly disrupt their normal behavioral patterns, and where no federally-listed species habitats will occur. A specific example is the removal of debris from a lakeshore located within federally-listed species habitat but with no recorded federally-listed species at the place of proposed activity (Exhibit 5);

b. Removal of building rubble and other debris from areas or facilities (*e.g.*, residential and commercial buildings within a city) following a disaster when federally-listed species or habitats are nearby and the only affect would be one of increased activity in the general vicinity, increased noise, *etc.* and where all conservation measures as outlined in Appendices B & C are implemented.

5.1.2.2 Upgrading or otherwise modifying buildings:

a. Upgrading buildings to meet current codes and standards, when such activities are conducted in the vicinity of federally-listed species or within federally-listed species habitats and the only affect would be one of increased activity in the general vicinity, increased noise, *etc.* and where all conservation measures as outlined in Appendices B & C are implemented;

A project involving fill placement or other ground disturbance activities in a previously disturbed area in order to elevate or flood-proof a structure adjacent to a watercourse above flood levels would be considered "not likely to adversely affect" federally-listed species or their habitats if no federally-listed species will be directly or indirectly killed, injured, or intentionally or negligently harassed to such an extent as to significantly disrupt their normal behavioral patterns, and where no federally-listed species habitats occur.

b. Modifying buildings to meet another need of the sub-grantee, such as with an improved action or an alternate action (described previously), provided the only effect would be one of increased activity in the general vicinity, increased noise, *etc.* and where all conservation measures as outlined in Appendices B & C are implemented.

5.1.2.3 Providing temporary facilities:

Providing temporary facilities within the immediate proximity of federally-listed species or within their habitat, provided that the appropriate conservation measures are implemented such that no federally-listed species will be directly or indirectly killed, injured, or intentionally or negligently harassed to such an extent as to significantly disrupt their normal behavioral patterns, and where no federally-listed species habitats will occur. Examples include developing pads for dwellings after implementing actions to remove or exclude all federally-listed species from the area where the pad was to be constructed (*i.e.*, exclusionary fencing with one-way exit funnels, delaying the action until after seed set of federally-listed plant species, re-

aligning trenching routes to avoid destruction of burrows used by federally-listed species, *etc.*).

5.1.2.4 Acquiring and demolishing existing facilities:

Acquiring and demolishing existing structures, provided that any demolition or hauling of debris that is done in the immediate proximity of federally-listed species or within their habitats is done in a manner that results in insignificant, discountable, or wholly beneficial effects (*e.g.*, use of existing roads, posting and enforcing slow travel speeds to prevent accidental death or injury of a federally-listed species by construction vehicles, dirt and/or gravel roads are watered to prevent excessive dust, noise is kept to an absolute minimum, *etc.*).

5.1.2.5 Repairing, realigning, or otherwise modifying roads, trails, utilities, or rail lines:

Repairing, realigning, or otherwise modifying roads, trails, utilities, or rail lines provided that equipment is operated from an existing road to repair the road surface (*i.e.*, grading or paving) or to repair washed out shoulders or ditches. A specific example is where an existing road that bisects federally-listed species habitat is undermined and needs repaired, species are not known to occur in the immediate adjacent area, but they may use the area occasionally for dispersal (Exhibit 6).

5.1.2.6 Constructing new facilities or relocating existing facilities:

Constructing new facilities or relocating existing facilities, provided that the construction or relocation of a facility is done in a location and/or in a manner using the appropriate conservation measures such that no federally-listed species will be directly or indirectly killed, injured, or intentionally or negligently harassed to such an extent as to significantly disrupt their normal behavioral patterns, and where no federally-listed species habitats occur. Examples include constructing new facilities on a previously-disturbed site that is adjacent to federally-listed species habitats but where no individuals will be incidentally taken by the action (*e.g.*, an individual wanders into the construction area and is hit by a vehicle or piece of equipment).

5.1.2.7 Relocating the function of an existing facility:

FEMA does not anticipate that relocating the function of an existing facility will require a "not likely to adversely affect" determination, except in rare circumstances where, for example, relocating students from a damaged school to an existing school required modifications to existing utilities or roads such that there may be an effect on federally-listed species or their habitats. In those cases, the relocation of the facility's function would be done in a manner consistent with the appropriate conservation measures such that no federally-listed species will be directly or indirectly killed, injured, or intentionally or negligently harassed to such an extent as to significantly disrupt their normal behavioral patterns, and where no federally-listed species habitats occur. If a facility cannot be relocated in such a manner, it will not qualify under Category 2 and must be considered under Category 3 as a "likely to adversely affect" action.

5.1.2.8 Extending the pressurized water service area:

Extending the pressurized water service area provided that the appropriate conservation measures are implemented such that no listed species will be directly or indirectly killed, injured, or intentionally or negligently harassed to such an extent as to significantly disrupt their normal behavioral patterns, and where no adversely modified listed species habitats will occur. Examples include delaying trenching through a population of listed plants until the plants have set seed, re-routing trenching areas to avoid significant affects to listed species and their habitats, *etc.*).

5.1.2.9 Developing demonstration projects:

Developing demonstration projects for the purposes of public education and outreach, provided that the project is implemented such that no listed species will be directly or indirectly killed, injured, or intentionally or negligently harassed to such an extent as to significantly disrupt their normal behavioral patterns, and where no adversely modified listed species habitats will occur (*e.g.*, building a display or holding a demonstration at the edge of listed species habitat rather than within the habitat).

5.1.2.10 Actions involving watercourses and coastal features:

In general, all work conducted in a watercourse will be conducted in a dry channel during the dry period, generally defined as June 15-October 15, and in accordance with terms and conditions in California Department of Fish and Game Code section 1600 Streambed Alteration Agreements and any conditions imposed by the state water quality control board, air quality control board, Corps permits, county grading permits, *etc.* In coordination with the Service, some modifications may be made to the timeframe on a site specific basis provided that change does not conflict with other regulatory requirements.

a. repairing, stabilizing, or armoring embankments using the exact material (or more environmentally-friendly materials) that were pre-existing at the site, replacing the exact amount (*i.e.*, volume or linear feet) of material that was lost or damaged, and placing it in the exact same location where the material previously existed, using normally accepted, standardized engineering practices, and following the conservation measures as outlined in Appendices B & C. For example, replacing a few feet or riprap along a bridge abutment where riprap previously existed and where no federally-listed species or their habitats occur or replacing soil that eroded from an embankment due to wave action (Exhibit 7).

   Projects of this nature will be determined to "not likely to adversely affect" federally-listed species or their habitats when there are only federally-listed plant species present provided that the activity would not result in adverse affects to the species or destruction or adverse modification of designated or proposed critical habitat. Projects such as these that are conducted in areas with federally-listed non-plant species or their habitats <u>may not qualify</u> for a "not likely to adversely affect" determination due to the definition of take in the ESA. All federally-listed non-plant species require an Incidental Take Statement that can only be issued in a biological opinion from the Service. FEMA would only make a "not likely to adversely affect" determination on projects of this nature upon further consultation with the Service.

   If bioengineering techniques are used, additional types of materials, volumes, linear footages, and placements also could be considered to not likely to adversely affect listed species or their habitats. The project proponent should contact the appropriate Service Field Office for site-specific guidance prior to proceeding.

b. Creating, widening, clearing, or dredging a waterway: given the direct and indirect effects to federally-listed species and their habitats that are typically associated with these types of actions (*e.g.*, increased sedimentation), FEMA anticipates that they will make few, if any, "not likely to adversely affect"

determinations for these actions. Under certain circumstances where appropriate conservation measures can be implemented in order to avoid all take of federally-listed species and their habitat, it may be possible; however, it is anticipated that these actions will be reviewed for qualification under Category 3 below.

c. Constructing or modifying a watercourse crossing (*e.g.*, culvert or small bridge) with the exact same size culvert or bridge, using the exact same materials (or more environmentally-friendly materials), in the exact same location as it previously existed, when no federally-listed species or their habitats are present in the immediate proximity of the project (*i.e.*, where an individual will be killed or injured) and with no upstream or downstream effects. For example, a culvert replacement at a site where California red-legged frogs are detected at the site or are previously known to occupy the site would not qualify because an Incidental Take Statement would be needed to harass or harm the frogs; whereas a culvert replacement in a creek with known California red-legged frogs, but where no frogs are detected at the site or are previously known to occupy the site, would qualify if all guidelines, measures, assumptions, and intentions of this document were met;

d. Constructing or modifying a water detention, retention, or storage facilities: FEMA anticipates that they will make few, if any, "not likely to adversely affect" determinations for these actions when federally-listed species or their habitats are present. Under certain circumstances where appropriate conservation measures can be implemented in order to avoid all take of federally-listed species and their habitat, it may be possible; however, it is anticipated that these actions will be reviewed for qualification under Category 3 below.

e. Constructing or modifying other flood control structures: FEMA anticipates that they will make few, if any, "not likely to adversely affect" determinations for these actions when federally-listed species or their habitats are present. Under certain circumstances where appropriate conservation measures can be implemented in order to avoid all take of federally-listed species and their habitat, it may be possible; however, it is anticipated that these actions will be reviewed for qualification under Category 3 below.

f. Constructing or modifying coastal features: FEMA anticipates that they will make few "not likely to adversely affect" determinations for these actions when federally-listed species or their habitats are present. Under certain circumstances where appropriate conservation measures can be implemented in order to avoid all take of federally-listed species and their habitat, it may be possible. For example, the replacement of a boat ramp or boat dock of the exact same size, in the exact same location, using the exact same materials (or more environmentally-

friendly materials) may qualify when no federally-listed species or their habitats are present in the immediate proximity of the project (*i.e.*, where an individual will be killed or injured) and with no upstream or downstream effects (Exhibit 8).

5.1.2.11 Vegetation management:

a. In instances where biological control of vegetation using sheep, cattle, horses, goats, or other livestock, is not compatible with federally-listed species or their habitats, FEMA (and its applicants) may chose to modify the timing, duration, and intensity of the grazing such that it is not likely to adversely affect federally listed species or their habitats. These modifications would be documented in an approved vegetation management plan or grazing plan and they would be in accordance with actions recommended in a published recovery plan.

b. FEMA may determine that some mechanical and/or hand clearing of vegetation is "not likely to adversely effect" federally-listed species or their habitats depending on the type of equipment used, the scope of the project, the location of the project, the proximity of federally-listed species or their habitats, *etc.* In those cases, FEMA will ensure that the action is carefully planned and implemented such that only insignificant or discountable effects occur to federally-listed species or their habitats. FEMA will evaluate each project on a case-by-case basis;

c. Herbicide treatment: under certain circumstances FEMA may make "not likely to adversely affect" determinations for projects involving the use of agrochemicals. For example, a project that hand clears vegetation and then sprays or paints the stumps of trees and brush to deter re-growth of vegetation. An action such as this, where herbicides are applied in very low quantities to very specific stumps according to labeled instructions and all applicable state and federal laws, may be considered to "not likely to adversely affect federally listed species or their habitats. FEMA will evaluate each project on a case-by-case basis;

5.1.3 CATEGORY 3 - LIKELY TO ADVERSELY AFFECT

Projects in this category are likely to adversely affect federally-listed species or their habitats. As such, FEMA anticipates that many of these types of projects cannot avoid the taking of federally-listed species or their habitats. For some projects, however, FEMA anticipates few, if any, are likely to adversely affect federally-listed species or their habitats; those project types are listed below. Examples of the types of projects that may be an exception to this determination

are provided under each project subheading. One possible exception that may apply to all projects would be if the project was of such a scope (due to the magnitude of the disaster, *e.g.,* post-Hurricane Katrina) that federally-listed species critical habitat was going to be adversely modified as a result of the action.

a. **Non-emergency debris removal:** a project where a federally-listed species such as a plant is present within or near the debris-removal area and will not be destroyed by the action (Exhibit 9).

b. **Upgrading or otherwise modifying buildings:** a project where a federally-listed species is known to occupy an area immediately adjacent to the building scheduled to be upgraded or modified. For example, in Santa Rosa where California tiger salamanders live in the backyards and vacant lots around residential and commercial structures.

c. **Providing temporary facilities:** a project to install tens to thousands of temporary facilities in federally-listed species habitat (*e.g.,* rangeland where vernal pools may be ripped, drained and leveled) as a result of a major disaster such as Hurricane Katrina.

d. **Acquiring and demolishing existing facilities:** similar to upgrading or modifying buildings where a building scheduled for demolition is immediately adjacent to federally-listed species such that there is no way to avoid the taking of an individual. For example, a San Joaquin kit fox (*Vulpes macrotis mutica*) pupping den under the foundation of a building.

e. **Relocating the function of an existing facility:** a project where the relocation of the function of a facility necessitated the development of roads or other infrastructure through federally-listed species habitat such that take of an individual was likely or probable.

f. **Extending the pressurized water service area:** a project where extending the water service area required, for example, trenching or other actions directly through habitat that supported federally-listed species such as critically-endangered plant species, snakes, salamanders, or small mammals where the take of an individual was likely or probable.

g. **Developing demonstration projects:** given the voluntary nature of these projects, FEMA does not anticipate any reason why these types of projects cannot be planned in such a manner as to avoid all take of federally-listed species or their habitats.

FEMA anticipates that the following projects are all likely to adversely affect federally-listed species or their habitats, except as noted previously through this document. Incidental take of federally-listed species is anticipated and/or cannot be avoided and coverage under a biological opinion is necessary.

For projects that initially fall into Category 3, FEMA will work with the Service to modify those projects, on a case by case basis, to achieve a Category 2 status, when possible. For projects that cannot be modified to achieve a "not likely to adversely affect" determination, there are two possible outcomes: 1) FEMA will determine that the project may not require additional consultation with the Service because it was previously reviewed and approved as part of a programmatic consultation with the Service that resulted in the issuance of a programmatic biological opinion, or 2) FEMA will initiate project-specific, formal consultation with the Service for all actions not previously reviewed and/or determined eligible under the programmatic consultations.

a. **Repairing, realigning, or otherwise modifying roads, trails, utilities, or rail lines**

b. **Constructing new facilities or relocating existing facilities**

c. **Actions involving watercourses and coastal features:**

1) Repairing, stabilizing, or armoring embankments (Exhibit 10);
2) Creating, widening, clearing, or dredging a waterway;
3) Constructing or modifying a watercourse crossing;
4) Constructing or modifying a water detention, retention, or storage facilities;
5) Constructing or modifying other flood control structures;
6) Constructing or modifying coastal features.

d. **Vegetation management:** In certain circumstances the use of mechanical or chemical means to control vegetation may result in take of listed species or adverse modification of designated critical habitat. For example, the use of a brush masticator to treat large areas of brush within the range of the Alameda whipsnake (*Masticophis lateralis euryxanthus*). Another example would be the aerial application of glyphosate to control *Lepidium* spp. or other noxious weeds over a large landscape.

6.1 CUMULATIVE AFFECTS

Many of the projects described in this PBA are typically-recurring actions where the effects are typically temporary and localized. However, the affects of other State, tribal, local, and private actions that could reasonably be expected to occur in addition to FEMA-funded projects would be additive. Additionally, many of these projects are implemented by the same applicant and are sometimes implemented in the same area, *i.e.*, the same watercourse. As such, there are additional cumulative affects as a result of the action(s). FEMA will consider the cumulative affects associated with funding projects, especially those projects that are in close proximity to each other, and they will consult with the Service on all actions that do not qualify under the programmatic consultations.

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8.1 LIST OF PREPARERS

Harry McQuillen, Lead Threatened and Endangered Species Specialist during FEMA-1628-DR-CA, prepared this programmatic biological assessment for the Public Assistance Program staff of the FEMA Region IX office, in San Francisco, California. Species information, draft review, and other input were received from the following people listed in alphabetical order:

Federal Emergency Management Agency

Sandro Amaglio, Rusty Anchors, John Hindley, and Tom Lang

U.S. Fish and Wildlife Service

Valarie Bloom, Amedee Brickey, Jim Browning, Roberta Gerson, Robin Hamlin, Gjon Hazard, Paul Henson, David Imper, Jan Knight, Jacob Martin, MaryAnn Owens, Donald Reck, Stephanie Rickabaugh, Lynn Roberts, Arnold Roessler, Roger Root, Darrin Thome, Elizabeth Warne, and Jim Watkins.

EXHIBITS

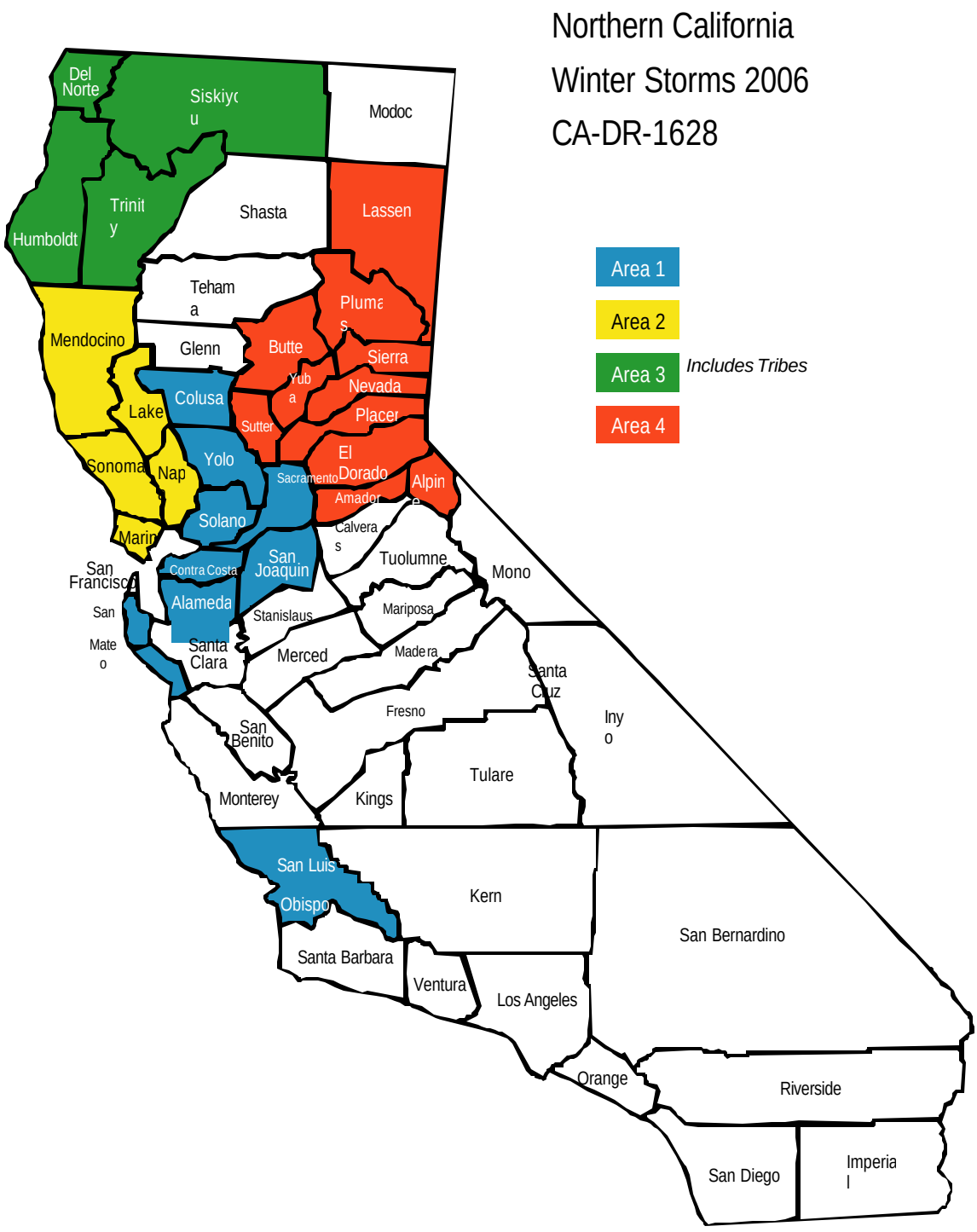

Exhibit 1a. Northern California counties within the federally-declared FEMA-1628-DR-CA disaster.

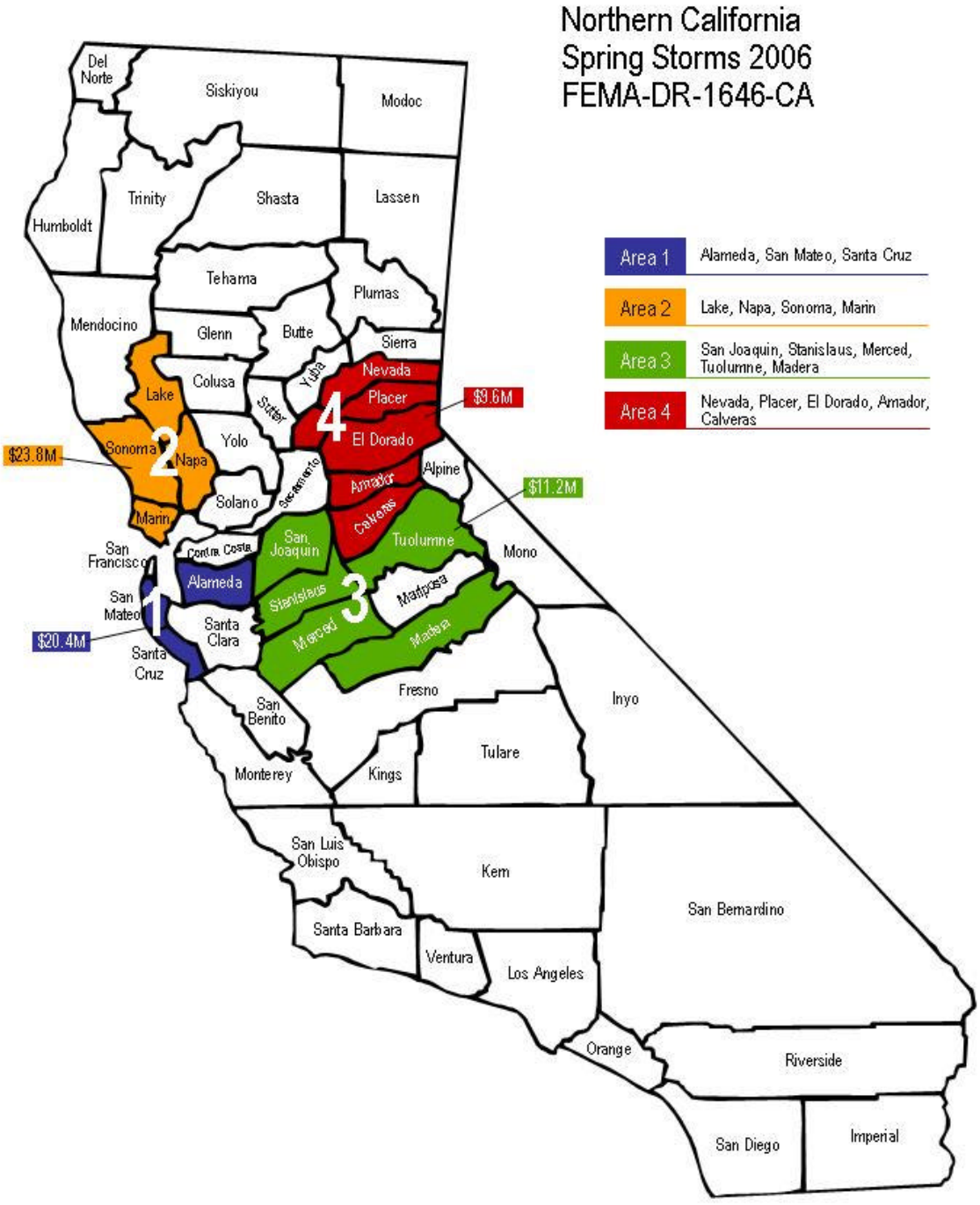

Exhibit 1b. Northern California counties within the federally-declared FEMA-1646-DR-CA disaster.

Exhibit 2. Silt deposited in pre-existing campground where the lawn is mowed regularly and no federally-listed species exist.

Exhibit 3. Replacement of damaged pump control and telemetry equipment from flood waters; no federally-listed species or habitats affected.

Exhibit 4. Edge of existing roadway washed out, minimal area damaged, no federally-listed species or habitats exist.

Exhibit 5. Debris floating on the surface of a lake so that it is blocking access to the boat ramp and causing a hazard to recreational users of the lake. Federally-listed species habitat does exist around the lake and a California red-legged frog was reported sited at the lake. If the work can be completed from a previously disturbed site such as the boat ramp, this would be a "not likely to adversely affect" action. If work must be completed from the lakeshore in the area where the frog was found, this may be a "likely to adversely affect" action and would then need to be reviewed for compliance under the programmatic biological opinion or it would require individual ESA section 7 consultation.

Exhibit 6. Roadside undermined: Alameda whipsnake, California tiger salamander, California red-legged frog, and possibly San Joaquin kit fox known to occur in the area but not known from the actual site. Implementation of the conservation measures could make this a "not likely to adversely affect" action. However, if pre-project surveys confirm that a federally-listed species occurs at the actual project site, this would be a "likely to adversely affect" action that would need to be reviewed for compliance under the programmatic biological opinion or it would require individual ESA section 7 consultation.

Exhibit 7. Levee erosion from wave action: Project is within the range of the giant garter snake, a highly aquatic species known to use canals and adjacent uplands. Implementation of the conservation measures could make this a "not likely to adversely affect" action. However, if pre-project surveys confirm that a federally-listed species occurs at the actual project site, this would be a "likely to adversely affect" action that would need to be reviewed for compliance under the programmatic biological opinion or it would require individual ESA section 7 consultation.

Exhibit 8. Replacement of a boat dock with the exact same type of boat ramp: Federally-listed species are known to occur in the area (*e.g.*, tidal marsh species, plovers, and terns), but no species will be harassed, injured or killed, and no habitat will be destroyed, as a result of this action. This would be a "not likely to adversely affect" action.

Exhibit 9. Roadway landslide: If no federally-listed species or habitats existed at or near this site, this would be a "no effect" action. If federally-listed species or habitats had the potential to be present; implementation of the conservation measures could make this a "not likely to adversely affect" action. If, however, a critically endangered federally-listed plant species such as Baker's larkspur occurred in this area (its last known population grows in Sonoma county on a roadside slope similar to the one pictured), this would be a "likely to adversely affect" action that would not qualify under the programmatic biological opinion and would require individual ESA section 7 consultation to ensure that the project did not jeopardize the continued existence of the species.

Exhibit 10. Creek embankment eroded from high flows, currently threatening integrity of adjacent bike path: California red-legged frog is known to occur in the area. This would be a "likely to adversely affect" action that would need to be reviewed for compliance under the programmatic biological opinion or it would require individual ESA section 7 consultation.

APPENDIX A

APPENDIX A

Listed, proposed and candidate species addressed in the Programmatic Biological Assessment for Projects Funded by the Federal Emergency Management Agency (FEMA).

This list only includes species within the 30 counties included in the FEMA-1628-DR disaster declaration. FEMA-1628-DR-CA counties are in BOLD font

Species indicated with an asterisk in the "Status" column (*e.g.*, E*) are considered to be "critically" endangered species as defined previously.

SPECIES	SCI. NAME	STATUS	COUNTIES (FEMA-1628-DR-CA counties in bold)	C.H.	NOTES
Alameda whipsnake	*Masticophis lateralis euryxanthus*	T	**ALA, CCA,** SCL, SJQ	Proposed	Chaparral, grasslands, oak-savanna, ephemeral drainages
Antioch Dunes evening-primrose	*Oenothera deltoides ssp. howellii*	E	**CCA**	YES	Occurs in several locations near the confluence of the Sacramento and San Joaquin Rivers, primarily Antioch Dunes NWR. Also at Brannan Island State Recreation Area
Baker's larkspur	*Delphinium bakeri*	E*	**MRN, SON*** * = extirpated	YES	Only one known pop. Remaining. Historically known from Coleman Valley in Sonoma Co. and from near Tomales in Marin Co.
Baker's stickyseed	*Blennosperma bakeri*	E	**SON**	None	Grasslands and vernal pools; species is restricted to the Laguna de Santa Rosa and Sonoma areas. Currently 22 populations believed to be extant.
bald eagle	*Haliaeetus leucocephalus*	T	**ALA**, **ALP, BUT, COL**, **DNT, ELD**, **GLE, HUM, LAK, LAS, MEN, MRN, NAP, NEV, PLA, PLU, SAC, SCZ, SIE, SIS, SJQ,**	None	Migratory bald eagles seen in California mainly from December to March. Eagles are usually associated with a source of permanent water, such as reservoirs, lakes, and free-flowing rivers, with abundant fish and nearby sites for perching, roosting, and, in season, nesting. Breeding season for bald eagles begins in February and lasts through July. They breed in open areas along coasts, rivers, and large lakes, usually away from human

Primary Sources: http://ecos.fws.gov/species_profile/; http://www.fws.gov/cno/arcata/es/; http://www.fws.gov/sacramento/es/spp_info.htm; http://www.fws.gov/ventura/es/es_index.html; http://www.dfg.ca.gov/; and http://plants.usda.gov/.

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			SMT, SOL, SON, SUT, TRI, YOL, YUB AMA, CAL, FRE, INY, KNG, KRN, MAD, MER, MNO, MOD, MAR, RIV, SBA, SBD, SBE, SCL, SFO, SHA, STA, TEH, TUL, TUO, VEN		disturbances. In California, approximately 87% of their nest sites were within 1 mile of water. Platform nests are built in large snags and old growth trees with open branches from 10-200 feet above the ground. Some eagles have been known to use the same nest for more than 35 years. Counties listed are documented breeding territories based on data from the California Department of Fish and Game (1959-1997).
Banded dune (aka Morro shoulderband) snail	*Helminthoglypta walkeriana*	E	**SLO**	YES	Coastal dunes and scrub communities and maritime chaparral. Currently known range includes areas south of Morro Bay, west of Los Osos Creek and north of Hazard Canyon. Historically, species also reported near the city of San Luis Obispo and south of Cayucos.
Bay checkerspot butterfly	*Euphydryas editha bayensis*	T	**SMT, ALA*, CCA*,** SCL * = extirpated	YES	Exists on shallow, serpentine-derived or similar soils. Primary larval host plant is dwarf plantain (*Plantago erecta*). Historically occurred east, west, and south of San Francisco Bay, from Twin Peaks in San Francisco and Mount Diablo in Contra Costa Co. south approximately to Hollister. Currently five known core areas— one on the San Francisco peninsula, one in San Mateo Co., and four in Santa Clara Co. Any site with appropriate habitat within the historic range should be considered potentially occupied.

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APPENDIX A

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Behren's silverspot butterfly	*Speyeria zerene behrensii*	E*	**MEN, SON**	None	Currently only one population known on private land near Pt. Arena. Historic range extended from the mouth of the Russian River in Sonoma County northward along the immediate coast to southern Mendocino County in the vicinity of Point Arena. The range in Mendocino County is currently considered to be within 1 mile of marine waters from Laguna Point in MacKerricher State Park south to the Russian River mouth. In the Point Arena area the range extends further inland.
beach layia	*Layia carnosa*	E	**HUM, MRN, SON**, SBA, MNT* * = extirpated	None	Seven dune systems from Santa Barbara Co. to Humboldt Co. 19 extant occurrences.
Ben Lomond spineflower	*Chorizanthe pungens* var. *hartwegiana*	E	**SCZ**	None	Ben Lomond sandhills community from Big Basin State Park to Felton area in Santa Cruz Mtns. Mostly on private lands.
blunt-nosed leopard lizard	*Gambelia silus*	E*	**SLO (Carrizo Plain area),** FRE, KNG, KRN, LAX, MAD, MER, MNT, SBA, SBD, SBE, TUL, VEN	None	Inhabits open, sparsely vegetated areas of low relief on the San Joaquin Valley floor and the surrounding foothills. It also inhabits alkali playa and valley saltbush scrub. In general, it is absent from areas of steep slope, dense vegetation, or areas subject to seasonal flooding. Historically, the species probably ranged from Stanislaus County in the north to the Tehachapi Mountains of Kern County in the south, and from the Coast Range mountains, Carrizo Plain and Cuyama Valley in the west to the foothills of the Sierra Nevada in the east. The currently occupied range consists of scattered parcels of undeveloped land on the Valley floor, most

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					commonly annual grassland and valley sink scrub. In the southern San Joaquin Valley, extant populations are known to occur in the following locations: Kern and Pixley National Wildlife Refuges; Liberty Farms, Allensworth and Antelope; Carrizo and Elkhorn plains; Buttonwillow, Elk Hills and Tupman Essential Habitat Areas; north of Bakersfield around Poso Creek; western Kern County around the towns of Maricopa, McKittrick and Taft.
Burke's goldfields	*Lasthenia burkei*	E	**SON, LAK, MEN**	None	Vernal pool species. Historically, 39 populations were known from the Cotati valley, 2 sites in Lake county, and one site in Mendocino County.
Butte County (Shippee) meadowfoam	*Limnanthes floccosa ssp. californica*	E	**BUT,** TEH	YES	Vernal pool species. Eleven known pop. In and around the City of Chico.
California brown pelican	*Pelecanus occidentalis californicus*	E	**Coastal California** **ALA, CCA, DEL, HUM, MEN, MRN, NAP, SCZ, SLO, SMT, SOL, SON,** MNT, SBA, SCL, SDG, SFO, VEN	None	Non-breeding California brown pelicans range northward along the Pacific Coast from the Gulf of California to southern British Columbia. Important roosting sites include offshore rocks and islands, river mouths with sand bars, breakwaters, pilings, and jetties along the Pacific Coast and San Francisco Bay
California clapper rail	*Rallus longirostris obsoletus*	E*	**SF bay area, San Pablo bay area,**	None	Restricted almost entirely to the marshes of San Francisco estuary. In south San Francisco Bay, there are populations in all of the

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			Suisun marsh area **ALA, CCA, MRN, NAP, SCZ, SLO*, SMT, SOL, SON,** MNT*, SCL, SFO * = extirpated		larger tidal marshes. Small populations are widely distributed throughout San Pablo Bay. Sporadic and in low numbers throughout the Suisun Marsh Area (Carquinez Strait to Browns Island, including tidal marshes adjacent to Suisun, Honker, and Grizzly Bays). Historically occurred in Morro Bay and Monterey Bay (Elkhorn Slough); now extirpated.
California condor	*Gymnogyps californianus*	E*	**SLO,** KRN, LA X, MNT, SBA, VEN	YES	Critically endangered, on-going captive propagation and reintroduction program. Nests in caves or clefts on cliffs, and in trees such as burned-out redwood snags with a clear approach for easy take-offs and landings. Carrion feeder.
California freshwater shrimp	*Syncaris pacifica*	E	**LAK, MEN, MRN, SON, NAP**	None	Four general geographic regions: 1) Tributary streams in the lower Russian River drainage, 2) Coastal streams flowing westward directly into the Pacific Ocean, 3) Streams draining into Tomales Bay, 4) Streams flowing southward into northern San Pablo Bay. Excellent habitat conditions include: Streams of 12 to 36 inches in depth with exposed live roots of trees such as alder and willow, along undercut banks greater than 6 inches, with overhanging overhanging woody debris or stream vegetation and vines such as stinging nettles, grasses, vine maple and mint.
California jewelflower	*Caulanthus californicus*	E	**SLO (eastern half),** FRE, KNG*, KRN, SBA, TUL, VEN	None	Pop's known to occur in Santa Barbara Canyon, Carrizo Plain, and Kreyenhagen Hills in Fresno County.

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California least tern	*Sterna antillarum (=albifrons) browni*	E*	**Coastal California, SF bay area,** **ALA, CCA, MRN, NAP, SCZ, SMT, SOL, SLO,** LAX, MNT, SBA, VEN, ORG, SCL, SDG,	None	Don Edwards San Francisco Bay NWR and Guadalupe-Nipomo Dunes NWR in San Luis Obispo County. Breeds along the Pacific Coast of California from San Francisco southward to Baja California. Winters along the Pacific coast of southern Mexico and the Gulf of California.
California red-legged frog	*Rana aurora draytonii*	T	**ALA, BUT, CCA, ELD, MEN, MRN, NAP, NEV, PLA, PLU, SCZ, SJQ, SMT, SLO, SOL, SON, TRI, YUB** AMA, CAL, FRE, MER, MNO, MNT, MOD, RIV, SBA, SBD, SBE, SCL, SFO, STA, TEH, TUO, VEN, LAX	YES	Wetlands, marshes, mining ponds, streams, creeks, sewage treatment ponds, cattle stock ponds, *etc*. Based on historic records, red-legged frogs may occur in other counties as well as those that are listed.
California seablite	*Suaeda californica*	E*	**SLO, SF bay** (ALA*, CCA*) * = extirpated	None	Only one naturally-occurring locality in Morro Bay and one small population re-established in 2003 in San Francisco Bay (Pier 98, San Francisco). Current reintroduction projects on-going in SF Bay.

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California spotted owl	*Strix occidentalis*	C	**LAS, PLU, SIE, NEV, PLA, ELD, AMA, ALP, YUB, SLO**	None	Generally requires a multi-layered, multi-species canopy with moderate to high canopy closure, trees with large cavities and other deformities, large snags and down wood. Found in younger forests which contain structural characteristics of older forests. Occurs along the west side of the Sierra Nevada from Shasta Co. south to Tehachapi Pass, and in all major mountains of southern California, including the San Bernardino, San Gabriel, Tehachapi, north and south Santa Lucia, Santa Ana, Liebre/Sawmill, San Diego, San Jacinto and Los Padres ranges and in the central Coast Ranges at least as far north as Monterey County.
California tiger salamander	*Ambystoma californiense*	T/E	**AMA, ALA, BUT, COL, CCA, ELD, MRN, NAP, PLA, SAC, SJQ, SLO, SMT, SOL, SUT YOL, YUB, SCZ, SON**,** SBA**, MNT, SBE,	YES	Breeds primarily in vernal pools and other shallow ponds. Spends most of life underground in burrows located in grasslands and other upland areas. **The Sonoma and Santa Barbara County populations are designated as Distinct Population Segments and were listed separately as endangered. The central population is listed as threatened.
Calistoga allocarya	*Plagiobothrys strictus*	E	**NAP**	None	Found in foothill grasslands of Napa Co. in moderately wet areas, including vernal pools, next to and fed by hot springs and small geysers
callippe silverspot	*Speyeria callippe callippe*	T	**ALA, SMT, CCA,**	None	Grasslands and adjacent habitats with larval food plant, Johnny

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butterfly			**NAP, SOL**		jump-up (*Viola pedunculata*). Historically occurred in 7 pop's in the San Francisco Bay region. Currently found at San Bruno Mountain and Sign Hill near South San Francisco, in the hills near Pleasanton, at Sears Point, and in the hills between Vallejo and Cordelia.
Camatta canyon amole	*Chlorogalum purpureum var. reductum*	T	**SLO, MNT**	YES	This species comprises two varieties, *C. p. var. purpureum* and *C. p.* var. *reductum*. *Chlorogalum purpureum* var. *purpureum* is known only from the south coast ranges in Monterey County, on lands managed by the Department of the Army at Fort Hunter Liggett. The other variety, *C. p.* var. *reductum*, is known only from two sites in the La Panza region of the coast ranges in San Luis Obispo County, on U.S. Forest Service and private lands. Habitat is known from oak woodlands and grasslands
Carson wandering skipper	*Pseudocopaeodes eunus obscurus*	E	**LAS**	None	Two locations in Lassen co. occur approximately 8 km (5 mi) apart. One location occurs on public lands managed by the California Department of Fish and Game (CDFG property). Another location is found on both private and public lands (private/public property). Based on commonalities of known, occupied sites, suitable habitat for the Carson wandering skipper has the following characteristics: elevation of less than 1,524 meters (5,000 feet); located east of the Sierra Nevada; presence of salt grass; open areas near springs or water; and geothermal activity.
Chinese camp brodiaea	*Brodiaea pallida*	T	**CAL, TUO**	None	Grows in seeps and springs in serpentine and volcanic soils in the

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					central California Sierra foothills. Two extant populations, one each in Calaveras and Tuolumne counties.
Chorro Creek bog thistle	*Cirsium fontinale var. obispoense*	E	**SLO**	None	Restricted to open seep areas on serpentine soil outcrops. Known from nine locations, eight are south and west of San Luis Obispo; one near San Simeon.
Clara Hunt's milk-vetch	*Astragalus clarianus*	E	**NAP, SON**	None	Found on serpentine soils or some thin, rocky volcanic clay soils in foothill grasslands and openings in manzanita and blue oak woodlands.
Colusa grass	*Neostapfia colusana*	T	**COL*, SOL, YOL,** MAR, MER, STA, TUO * = extirpated	YES	Vernal pools and associated grasslands.
conservancy fairy shrimp	*Branchinecta conservatio*	E	**BUT, SOL,** COL, MAR?, MER, STA?, TEH, VEN	YES	Vernal pools and associated grasslands.
Contra Costa goldfields	*Lasthenia conjugens*	E	**ALA, CCA, MEN*, NAP, SOL,** MNT, SBA*, SCL*	YES	Vernal pools and associated grasslands.

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Contra Costa wallflower	*Erysimum capitatum ssp. angustatum*	E	**CCA**	YES	Grows naturally only in sand dune habitat along the San Joaquin River at Antioch Dunes NWR.
delta green ground beetle	*Elaphrus viridis*	T	**SOL**	YES	Vernal pools and associated grasslands.
delta smelt	*Hypomesus transpacificus*	T	**CCA, NAP, SAC, SJQ, SOL, YOL**	YES	Found only from the Suisun Bay upstream through the Delta along the freshwater edge of the mixing zone (saltwater-freshwater interface), where the salinity is approximately 2 ppt.
El Dorado bedstraw	*Galium californicum ssp. sierrae*	E	**ELD**	None	Grows in oak woodland areas, including sites with ponderosa pine and gray pine, on gabbro soils. Restricted to one localized area--Pine Hill, and surrounding ridges to the west within a distance of approximately 2.5 miles.
few-flowered navarretia	*Navarretia leucocephala ssp. pauciflora*	E	**LAK, NAP**	None	Vernal pools on volcanic substrates, usually volcanic ash, in the north coast ranges of California.
fleshy owl's-clover	*Castilleja campestris ssp. succulenta*	T	**SJQ,** FRE, MAD, MER, MAR, STA, TUO	YES	Found only in vernal pools along the rolling lower foothills and valleys along the eastern San Joaquin Valley.
Fountain thistle	*Cirsium fontinale var. fontinale*	E	**SMT**	None	Restricted to perpetually moist clay openings in riparian or serpentine chaparral.
Fresno kangaroo rat	*Dipodomys nitratoides exilis*	E*	**MER*, MAD*,** FRE*, KNG	YES	Possibly extinct. Historic range encompassed an area of grassland and chenopod scrub communities on the San Joaquin Valley floor, from about the Merced River, Merced County, on the north, to the

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Gambel's watercress	*Rorippa gambellii*	E	**SLO,** LA*, ORG*, SBA, SBR*, SDG?*, BAJA * = extirpated	None	Found in freshwater or brackish marsh habitats at the margins of lakes or along slow-flowing streams, from 20 to 50 in elevation. The species requires a permanent water source. Historically more widespread from San Diego Co. to Santa Barbara Co. The three known extant populations occur in San Luis Obispo County at Black Lake Canyon, Oso Flaco Lake, arid Little Oso Fiaco Lake.
Gentner's fritillary (Genter's mission bell)	*Fritillaria gentneri*	E	**SIS,** Oregon	None	Found primarily in very small, scattered occurrences in Jackson and Josephine Counties in southwestern Oregon; one small additional population was recently discovered in northern California, near the Oregon border. Highly localized within a 30-mile radius of Jacksonville Cemetery.
giant garter snake	*Thamnophis gigas*	T	**BUT, CCA, COL, NAP, PLA, SUT,**	None	Inhabits rice fields and agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes,

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APPENDIX A

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			SOL, SAC, SJQ, YOL, YUB, FRE, GLE, KNG, KRN, MAD, MER, RVR*, STA, TUL		low gradient streams, and adjacent uplands in the Central Valley. *No known occurrences recorded in CNDDB in KNG, MAD, NAP, PLA, STA, TUL, or YUB Counties to date. *RVR County recorded in CNDDB.
giant kangaroo rat	*Dipodomys ingens*	E	**SLO,** FRE, KNG, KRN, MER, MNT, SBA, SBE, TUL, VEN	None	Grasslands in and along the slopes of the San Joaquin Valley.
Greene's tuctoria	*Tuctoria greenei*	E	**BUT, SJQ*,** MAD*, MER, MAR?, SHA, STA*, TEH, TUO?, FRE*, GLE, TUL* * = extirpated	YES	Vernal pools and associated grasslands.
hairy Orcutt grass	*Orcuttia pilosa*	E	**BUT,** GLE, MAD, MER, STA, TEH, FRE?, MAR?	YES	Vernal pools and associated grasslands.
Hartweg's golden sunburst	*Pseudobahia bahiifolia*	E	**MAD, MER, STA, SUT*, TUO, YUB*** FRE * = extirpated	None	Occurs in open grasslands and grasslands at the margins of blue oak woodland, primarily on shallow, well-drained, fine-textured soils, nearly always on the north or northeast facing of Mima mounds. Remaining populations are concentrated in the Friant region of Fresno and Madera counties and the La Grange region in

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					Stanislaus County.
Hickman's potentilla	*Potentilla hickmanii*	E	**SMT, SON*,** MNT * = extirpated	None	Known from one site on the Monterey Peninsula and at one site in San Mateo County. The population in Monterey County grows in fine sandy soils within an opening of Monterey pine forest that supports wet conditions for a variety of native and nonnative grassland species. The population in San Mateo County was rediscovered on private land in 1995 by biologists conducting surveys for a highway project.
Hoover's spurge	*Chamaesyce hooveri*	T	**BUT,** GLE, TEH, MER, STA, TUL, TUO?	YES	Vernal pools and associated grasslands.
Howell's spineflower	*Chorizanthe howellii*	E	**MEN**	None	Known historically and currently from coastal dunes north of Fort Bragg in Mendocino County
Indian Knob mountain balm	*Eriodictyon altissimum*	E	**SLO**	None	Chaparral, cismontane woodland, coastal scrub. Six occurrences in the Irish Hills and Indian Knob.
Ione & Irish Hills buckwheat	*Eriogonum apricum*	E	**AMA**	None	Only occurs within openings of Ione chaparral on gravelly red clay soils of the Ione formation.
Ione manzanita	*Arctostaphylos myrtifolia*	T	**AMA,** CAL	None	Occurs primarily on outcrops of the Ione Formation within an area of about 35 square miles in Amador County.
Kenwood Marsh checkermallow	*Sidalcea oregana ssp. valida*	E	**SON**	None	Has only been found in two freshwater marshes in Sonoma County: Kenwood Marsh and Knights Valley.

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Kneeland Prairie penny-cress	*Thlaspi californicum*	E*	**HUM**	YES	Endemic to serpentine soils in Kneeland Prairie, located in the outer north coast range of Humboldt County. The only known occurrence includes five relatively distinct groups of plants all located within 1,000 feet of each other. The species occupies an area divided by the Kneeland Airport and Mountain View Road. The known population consists of approximately 5,300 individuals. The five colonies occupy an estimated 0.8 acres in size.
LaGraciosa thistle	*Cirsium loncholepis*	E	**SLO,** SBA	YES	Largely restricted to back dune and coastal wetlands of southern San Luis Obispo County and northern Santa Barbara County, from the Pismo Dunes lake area and south historically to the Santa Ynez River. The Guadalupe Dune complex, in which the majority of the species occurs, extends inland only up to 2 miles. Deflation areas behind the foredunes often intersect the water table, creating wetlands and back dune lakes. *Cirsium loncholepis* is found in wet soils surrounding the dune lakes and in the moist dune swales, where it is often associated with *Juncus* spp. (rush), *Scirpus* spp. (tule), *Salix* spp. willow), *Toxicodendron diversilobum* (poison oak), *Distichlis spicata* (salt grass), and coyote brush (Hendrickson 1990).
Lahontan cutthroat trout	*Oncorhynchus clarki henshaw*	T	**PLA, ELD, ALP, NEV, SIE,** FRE, INY, MAD, MNO	None	Found in a wide variety of cold-water habitats including large terminal alkaline lakes (e.g., Pyramid and Walker lakes); alpine lakes (e.g., Lake Tahoe and Independence Lake); slow meandering rivers (e.g., Humboldt River); mountain rivers (e.g., Carson, Truckee, Walker, and Marys Rivers); and small headwater

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					tributary streams (e.g., Donner and Prosser Creeks). Stream spawner, spawning between February and July.
Lake County stonecrop	*Parvisedum leiocarpum*	E	**LAK**	None	Vernal pools and associated grasslands.
Lange's metalmark butterfly	*Apodemia mormo langei*	E	**CCA**	None	Currently found only at Antioch Sand Dunes in Contra Costa County. Most of the habitat is now part of the Antioch Dunes NWR.
large-flowered fiddleneck	*Amsinckia grandiflora*	E	**ALA, SJQ, CCA**	YES	Historically reported from a few locations in the northern Diablo Range of California. Currently known from Lawrence Livermore National Laboratory property in the hills east of Livermore and on nearby private land off of Corral Hollow Road. Experimentally reintroduced populations near Black Diamond Mine and Lo wry Ridge.
Layne's butterweed	*Senecio layneae*	T	**ELD, YUB,** TUO		Grows in open rocky areas of gabbro and serpentine soils within chaparral plant communities. Most known sites are in western El Dorado County (Pine Hill intrusion and adjacent serpentine). Some sites in the Eldorado National Forest, on BLM Red Hills Management Area in Tuolumne County, and on BLM land in Yuba County. Most on private land.
Least Bell's vireo	*Vireo bellii pusillus*	E	**SJQ, SCZ, SLO,** INY, KRN, LA X, SBA, SBD, SBE, VEN, RVR, SDG	YES (So. Cal only)	Found in riparian and associated upland habitats. Historically ranged from Red Bluff to Baja California. Currently known only in Southern California, except last year's documented breeding at the San Joaquin River NWR in San Joaquin County.

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Loch Lomond coyote-thistle	*Eryngium constancei*	E	**LAK, SON**	None	Three populations in Lake County and another is in Sonoma County.
longhorn fairy shrimp	*Branchinecta longiantenna*	E	**SLO, CCA, ALA,** MER,	YES	Found in vernal pools located within a matrix of alkali sink and alkali scrub plant communities at Carrizo Plain National Monument, in a series of sandstone outcrop pools in the Livermore Vernal Pool Region, from alkaline grassland vernal pools in Merced County.
Lost river sucker	*Deltistes luxatus*	E*	**SIS,** MOD	YES	Primarily lake residents that spawn in rivers, streams, or springs associated with lake habitats. Known from the Upper Klamath Lake and its tributaries, Clear Lake Reservoir and its tributaries, Tule Lake and the Lost River up to Anderson-Rose Dam, the Klamath River downstream to Copco Reservoir to Iron Gate Reservoir. In the Upper Klamath Lake watershed, Lost limited to Sucker Springs in Upper Klamath Lake, and the Sprague and Williamson Rivers. Spawning runs also occur in the Wood River and in Orookeñ Creek; additional run may occur in Sheepy Lake in the Lower Kiamath Lake watershed; spawning documented in the Clear Lake watershed
Lotis Blue Butterfly	*Lycaeides argyrognomon lotis*	E*	**MEN, SON*, MRN*** * = extirpated	None	Historically, found in wet meadows and sphagum-willow bogs at several coastal localities in Mendocino, northern Sonoma, and possibly northern Marin Counties. Currently known only from a sphagnum bog in the Pygmy Forest, Mendocino County, California. Suspected that they use either coast trefoil (Lotus formosissimus) or Bolanders' sweet pea (Lathyrus vestitus subsp.

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					bolanderi) as larval foodplants.
many-flowered navarretia	*Navarretia leucocephala ssp. plieantha*	E	**LAK, SON**	None	Found in dry meadows, along the margins of volcanic ash vernal pools and lakes and in open wet ground in forest openings. Only a few locations of this species are known from Lake and Sonoma counties. The plant grows in a 400 square mile area, at elevations from 1,800 to 2,800 feet.
Marbled murrelet	*Brachyramphus marmoratus*	T	**DEL, HUM, SIS, TRI, MEN, SON, MRN, SMT, SCZ**	Yes, new proposal due August 06	Listed population nests in older forests characterized by large trees, multiple canopy layers, and moderate to high canopy closure along Pacific coast in Washington, Oregon and California south to Monterey Bay. Nests are typically found in coastal redwood and Douglas-fir forests in CA.
Mardon skipper	*Polites mardon*	C	**DEL, SIS**	None	A northwestern butterfly with a disjunct range. Currently, this species is known from four widely separated locations: south Puget Sound region, southern Washington Cascades, Siskiyou Mountains of southern Oregon, and coastal California.
Marin dwarf-flax	*Hesperolinon congestum*	E	**MRN, SMT**, SFO	None	Restricted to serpentine s oils from Marin County south to San Mateo County, California. Two populations are found in serpentine chaparral; the others occur in serpentine bunchgrass habitat. There are six populations known from Marin County, one from San Francisco County, and seven from San Mateo County.
Mariposa pussy-paws	*Calyptridium pulchellum*	T	**MAD,** FRE, MAR	None	Grows in small, barren areas on decomposed granitic sands in

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					annual grasslands and woodlands at an elevation of between 1,500 and 3,600 feet. Seven small populations are patchily distributed over a 750 square mile area. Collectively, the seven populations are estimated to occupy a total of only 14 gross acres. Six of the seven populations are on private land.
marsh sandwort	*Arenaria paludicola*	E*	**SLO, MEN, SCZ*,** LAX, SBD*, SFO*, Washington State* * = extirpated	None	Swamps and freshwater marsh along the Pacific coast. Historically known from the Counties of San Francisco, Santa Cruz, San Luis Obispo, and San Bernardino. The only known extant location is in a small marshy area of Black Lake Canyon on the Nipomo Dunes Mesa in southwestern San Luis Obispo County.
McDonald's rock-cress	*Arabis macdonaldiana*	E	**DEL, MEN, SIS, TRI,** Oregon	None	Restricted to ultramafic rocks, chiefly peridotite, and soils derived from these.
Menzies' wallflower	*Erysimum menziesii*	E	**MEN, HUM,** MNT	None	Found within the foredunes and dune scrub communities and associated habitats occupied by coastal scrub or coastal terrace prairie.
Mission blue butterfly	*Icaricia icarioides missionensis*	E	**SMT, MRN,** SFO	None	A small colony is located on Twin Peaks (SF), also collected from Fort Baker, Marin County, majority are found on San Bruno Mountain, San Mateo County. Other colonies have been discovered in San Mateo County. Colonies located ranging from 690 to 1,180-foot elevation. Coastal chaparral and coastal grasslands dominate the vegetation type where colonies are found.
Monterey spineflower	*Chorizanthe pungens* var.	T	**SCZ, SLO**,** MNT	YES	Found scattered on sandy soils within coastal dune, coastal scrub,

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	pungens		* = extirpated		grassland, maritime chaparral, and oak woodland communities along and adjacent to the coast of southern Santa Cruz and northern Monterey Counties and inland to the coastal plain of Salinas Valley. **Only one collection dating from 1842 was reported from northern San Luis Obispo County.
Morro Bay kangaroo rat	*Dipodomys heermanni morroensis*	E*	**SLO**	YES	Occurs in habitats associated with stabilized sand dune, coastal dune and coastal sage scrub, and maritime chaparral communities. Sandy soils are essential for burrow construction. Crit. Hab is west of Pecho Valley Rd. Until recently, it was found only in several small areas of less than one-half square mile in total size near Los Osos in San Luis Obispo County. Currently, if it still exists, it is thought to inhabit just one small privately-owned parcel which remains in native vegetation. This species may be extinct.
Morro manzanita	*Arctostaphylos morroensis*	T	**SLO**	None	Found on Baywood fine sands in the Morro Bay area. Much of the historic habitat has been subject to urban development, primarily by the communities of Los Osos, Baywood Park, and Cuesta-by-the-Sea on the south and east sides of Morro Bay. Approximately 65 percent of the remaining is within private ownership.
Mountain yellow-legged frog	*Rana muscosa*	C	**ALP, BUT, ELD, NEV, PLA, PLU, SIE,** AMA, CAL, FRE, KRN, LAX, MAD, MNO, MAR,	None	The Sierra Nevada population ranges from southern Plumas County to southern Tulare County, and extends into Nevada in the vicinity of Lake Tahoe and northward to the slopes of Mount Rose. Inhabits lakes, ponds, springs and streams typically between 4,500 feet and 12,000 feet. A highly aquatic frog, it is

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			RVR, SBD, SDG, TEH, TUL, TUO		rarely found more than several jumps from water. At lower elevations, it may be found in rocky stream beds and wet meadows surrounded by coniferous forest. At higher elevations, it may be found in alpine ponds and lakes as well as montane meadow streams.
Mt. Herman June beetle	*Polyphylla barbata*	E	**SCZ**	None	Restricted to Zayante sand soils in the Felton USGS Quadrangle. Can persist in moderately-developed areas with suitable soils. Habitat areas are characterized by the plant species *Pinus ponderosa* and *Arctostaphylos silvicola*.
Myrtle's silverspot butterfly	*Speyeria zerene myrtleae*	E	**SON, MRN, NAP, SMT**	None	Found in coastal dune or prairie habitat. Historically found in dunes and bluffs from San Mateo Co. to the mouth of the Russian River in Sonoma Co. Pop's south of the Golden Gate apparently extirpated. Four pop's known to inhabit coastal terrace prairie, coastal bluff scrub, and associated grassland habitats in W. Marin and SW Sonoma counties, including the Pt. Reyes Nat'l Seashore.
Napa bluegrass	*Poa napensis*	E	**NAP**	None	Two pop's are known in the Calistoga area of Napa County. They are in grasslands and moist, alkaline meadows fed by geothermal hot springs. Both extant populations are on private land.
Nipoma mesa lupine	*Lupinus nipomensis*	E	**SLO**	None	Grows in stabilized back dune habitat of the Guadalupe dunes in the southwestern corner of San Luis Obispo County. The plant occurs as 1 extended population made up of 7 colonies with fewer than 700 plants. All known occurrences of *Lupinus nipomensis* are on private lands and remain unprotected.

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northern spotted owl	*Strix occidentalis caurina*	T	**COL, DEL, HUM, MEN, SIS, TRI, SHA, LAK,** TEH, GLE	YES	Listed pop's range from western Washington and Oregon into northwestern California south to Marin county. Southeastern boundary is the Pit River area in Shasta county. Generally requires a multi-layered, multi-species canopy with moderate to high canopy closure, trees with large cavities and other deformities, large snags and down wood. Found in younger redwood forests in CA which contain structural characteristics of older forests.
Ohlone tiger beetle	*Cicindela ohlone*	E*	**SCZ**	None	Coastal terrace habitat with Watsonville loam (Santa Cruz mudstone) (at < 1,200 feet elevation), especially remnant stands of native grassland characterized by plant species such as *Danthonia californica* and *Nassella pulchra*. Only five populations known to exist, each population is localized to an area less than 5 acres. Currently, the extent of potentially suitable habitat is estimated at only 200 to 300 acres in Santa Cruz County.
Oregon silverspot butterfly	*Speyeria zerene hippolyta*	T*	**DEL,** Oregon	YES	Requires coastal salt spray meadows, stabilized dunes, and/or montane meadows which are surrounded by forests. There are only eight remaining locations where the habitat and the silverspot occurs; only one healthy colony is known. Captive rearing is ongoing in Oregon.
Oregon spotted frog	*Rana pretiosa*	C	**Unknown--- possibly LAS, SIS,** MOD	None	Historically occurred from southwestern British Columbia south to the northeast corner of California. Almost entirely aquatic in habit, leaving the wetlands only occasionally and for short duration. Wetlands associated with lakes, ponds, and slow-

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					moving streams can provide suitable habitat.
Pacific fisher	*Martes pennanti pacifica*	C	**LAK, MEN, HUM, DEL, TRI, SIS, PLU,** INY, MNO **Possibly others in Sierras.**	None	Historically ranged throughout the Sierra Nevada from Greenhorn Mountain in northern Kern County to the southern Cascades at Mount Shasta. From there, they ranged west into the North Coast Ranges and Klamath Mountains from Lake and Marin Counties north to the State line. One population is located in northwestern California and the other is in the southern Sierra Nevada Mountains. Since 1990, there have generally been no detections outside these areas except for one in 1995 in Mendocino County and one in 1995 in Plumas County.
Paiute cutthroat trout	*Oncorhynchus (=Salmo) clarki seleniris*	T	**ALP,** MNO, MAD, FRE*, TUO*, INY* * = extirpated	None	Native to the Silver King Creek in the East Fork Carson River drainage of the Humboldt-Toiyabe National Forest.
pallid manzanita	*Arctostaphylos pallida*	T	**ALA, CCA**	None	Known from approximately 13 populations in Alameda and Contra Costa counties. The two largest populations are located at Huckleberry Ridge in Alameda and Contra Costa Counties and at Sobrante Ridge in Contra Costa County. Several other small, natural and planted populations occur in Alameda and Contra Costa counties. Typically found in maritime chaparral and coastal scrub.
palmate-bracted bird's-beak	*Cordylanthus palmatus*	E	**COL, ALA, YOL, SJQ*,** FRE, MAD	None	Grows on seasonally-flooded, saline-alkali soils in lowland plains and basins at elevations of less than 500 feet. Historically known

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			* = extirpated		from scattered locations from Fresno Co. to Colusa Co. and the Livermore Valley area of Alameda County. Currently known to occur at the Sacramento NWR (Glenn Co), Delevan NWR and Colusa NWR, and the combined Alkali Sink Ecological Reserve and Mendota Wildlife Management Area.
Parrish's checkerbloom	*Sidalcea hickmanii* ssp. *parishii*	C	**SLO (eastern),** SBA, SBD	None	Known from San Bernardino, Santa Barbara, and San Luis Obispo counties in southern California. Two populations occur in San Bernardino County. No more than a dozen plants have been found in one of these populations in the last decade. The populations in Santa Barbara and San Luis Obispo Counties are more remote from developed recreational areas. It grows in burned or cleared areas on dry, rocky slopes of both scrub oak and yellow pine forest
Pennell's bird's-beak	*Cordylanthus tenuis ssp. capillaris*	E	**SON**	None	Grows on serpentine soil flats within chaparral. It is known only from two locations in western Sonoma Co.
Pine Hill flannelbush	*Fremontodendron californicum ssp. decumbens*	E	**ELD**	None	Grows on scattered rocky outcrops either in chaparral or in the transitional zone between woodland and chaparral. The only known location is near Pine Hill in western El Dorado Co. Plants are scattered within an area of approximately 5,000 acres.
Pine Hill ceanothus	*Ceanothus roderickii*	E	**ELD**	None	Grows on gabbro soils. It is restricted to the Pine Hill intrusion in El Dorado Co.
Pismo clarkia	*Clarkia speciosa ssp. immaculata*	E	**SLO**	None	Found on pockets of dry sandy soils, possibly ancient sand dunes, in grassy openings in chaparral and oak woodlands. Five extant pop's located between San Luis Obispo and Nipomo Mesa area.

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Pitkin Marsh lily	*Lilium pardalinum ssp. Pitkinense*	E	**SON**	None	Grows only in freshwater marshes and wet meadows in Sonoma County. Three known locations.
Point Arena mountain beaver	*Aplodontia rufa nigra*	E*	**MEN**	None	Found in underground burrow systems in a variety of habitat types including coastal scrub, riparian, dune scrub, and coniferous forest plant communities. Potential range is the area in coastal Mendocino County located south of a point 2 miles north of Bridgeport Landing, north of a point 5 miles south of the town of Point Arena, and to a distance of 5 miles inland from the Pacific Ocean.
Presidio clarkia	*Clarkia franciscana*	E	**ALA,** SFO	None	Restricted to grassland communities on serpentine soils in San Francisco and Alameda counties. Two pop's known from the San Francisco Presidio. Three pop's known from the Oakland Hills in Alameda County, all from within 0.5 mile of each other.
Purple amole	*Chlorogalum purpureum var. purpureum*	T	**SLO,** MNT	YES	This species comprises two varieties, *C. p. var. purpureum* and *C. p.* var. *reductum. Chlorogalum purpureum* var. *purpureum* is known only from the south coast ranges in Monterey County, on lands managed by the Department of the Army at Fort Hunter Liggett. The other variety, *C. p.* var. *reductum*, is known only from two sites in the La Panza region of the coast ranges in San Luis Obispo County, on U.S. Forest Service and private lands. Habitat is known from oak woodlands and grasslands
Red Hills vervain	*Verbena californica*	T	**TUO**	None	Only grows at an elevation of 850 to 1,150 feet in the Red Hills and nearby Rawhide Hill in western Tuolumne County. The plants grow in moderately wet (mesic) areas, often in overflow channels,

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					along intermittent and perennial streams underlain by serpentine rocks, often in the blue oak (*Quercus douglasii*) or gray pine (*Pinus sabiniana*) woodland communities. The populations are distributed over about 90 acres within a 24 square mile area. Fifteen percent of the plants occur on lands administered by the Bureau of Land Management and 85 percent on privately owned lands.
Red Mountain buckwheat	*Eriogonum kelloggii*	C	**MEN**	None	Known only from fewer than 10 occurrences in the Red Mountain and Little Red Mountain areas of Mendocino County. It occurs on serpentine soil found in open rocky areas within montane coniferous forest. Among its associates is McDonald's rock cress. Populations of this species occur on private land and on BLM land, and a small area of this species' habitat occurs within the DFG's Little Red Mountain Ecological Reserve.
Red Mountain stonecrop	*Sedum eastwoodiae*	C	**MEN**	None	Grows on serpentine soils among rock outcrops; elevation 1,768-3,737 feet. Known from only three occurrences on Red Mountain east of Leggett and protected on Red Mountain Area of Critical Environmental Concern (BLM).
riparian brushrabbit	*Sylvilagus bachmani riparius*	E*	**SJQ**	None	Obligate riparian species. Known from Caswell Memorial State park, Thomas Payne Slough (Pardise cut) near Mossdale. Reintroduced to San Joaquin River NWR and adjacent private land as part of an on-going captive propagation program.
riparian woodrat	*Neotoma fuscipes*	E	**SJQ,** STA*, MER*	None	Inhabits riparian communities along the lower portions of the San

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			* = extirpated		Joaquin and Stanislaus rivers in the northern San Joaquin Valley. Historical records for the riparian woodrat are distributed along the San Joaquin, Stanislaus, and Tuolumne rivers, and Corral Hollow, in San Joaquin, Stanislaus, and Merced counties. Currently only known from at or near Caswell Memorial State Park, possible second pop. At San Joaquin River NWR.
robust spineflower	*Chorizanthe robusta*	E*	**SCZ, ALA*, SMT*,** MNT, SCL * = extirpated	YES	Historically occurred from Alameda to Monterey counties, but is currently known only from sandy and gravelly soils along and adjacent to the coast of southern Santa Cruz and northern Monterey counties. The only known extant populations occur northeast of the city of Santa Cruz and near Sunset and Manresa State Beaches
Sacramento Orcutt grass	*Orcuttia viscida*	E	**SAC**	YES	Grows in relatively large, deep vernal pools. Restricted to a region of approximately 135 square miles in eastern Sacramento Co., with no historic locations are known outside this area.
salt marsh harvest mouse	*Reithrodontomys raviventris*	E*	**SF Bay area, San Pablo Bay area, Suisun marsh** **ALA, CCA, MRN, NAP, SMT, SOL, SON,** SCL, SFO	None	The northern subspecies lives in the marshes of the San Pablo and Suisun bays, the southern in the marshes of Corte Madera, Richmond and South San Francisco Bay.
salt marsh bird's-beak	*Cordylanthus maritimus ssp. maritimus*	E	**SLO,** SBA, VEN, LAX, ORG, SDG,	None	Found in salt marshes on slightly raised hummocks at the north end of Mitchell Drive and Cuesta-by-the-Sea at the south end of

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			BAJA		Morro Bay, at the north end of Morro Spit west of Morro Bay, and at the north end of Morro Spit due west of Fairbank Point and southwest of Morro Bay.
San Bruno elfin butterfly	*Incisalia mossii bayensis*	E	**SMT, CCA, MRN,** SFO	None	Found in coastal mountains near San Francisco Bay, in the fog-belt of steep north facing slopes that receive little direct sunlight. Colonies are known today on San Bruno Mountain, Milagra Ridge and Montara Mountain of San Mateo Co.; Mount Diablo in Contra Costa Co.; and near Alpine Lake and at Dillon Beach in Marin Co.
San Francisco garter snake	*Thamnophis sirtalis tetrataenia*	E*	**SMT, SCZ,** SCL?, SFO?	None	Occur in scattered wetland areas on the San Francisco Peninsula from approximately the San Francisco Co. line south along the eastern and western bases of the Santa Cruz Mountains, at least to the Upper Crystal Springs Reservoir, and along the coast south to Año Nuevo Point, San Mateo Co., and Waddell Creek, Santa Cruz Co.
San Francisco lessingia	*Lessingia germanorum*	E	**SMT,** SFO	None	Stabilized older coastal sand dunes and sandy soils with moderately open scrub or herbaceous vegetation on the San Francisco peninsula; San Bruno Mtn.
San Joaquin kit fox	*Vulpes macrotis mutica*	E	**CCA, ALA, SJQ, SLO,** MNT, SBA, SBE, SCL, FRE, KNG, KRN, MAD, MER, MNT, STA, TUL, TUO, VEN	None	Found in grassland and scrubland communities. Historically believed to have ranged from southern Kern Co. north to Contra Costa Co. on the west side and near La Grange, Stanislaus Co. on the east side. Also found in the Antioch area of Contra Costa Co. Uses human-made structures (culverts, abandoned pipelines, or banks in sumps or roadbeds).

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San Joaquin Valley orcutt grass	*Orcuttia inaequalis*	T	**MAD, MER, STA, SUT*, TUL, SOL,** FRE * = extirpated	Yes	Vernal pool species. Eastern Merced County is considered a critical region for the conservation of this species from the perspective of being located near the historical geographic center of the range, for harboring a large majority of the extant occurrences, and for harboring one of the largest incompletely surveyed blocks of quality habitat within the species' range.
San Joaquin wooly-threads	*Lembertia congdonii*	E	**SLO,** SBA, SBE, FRE, KNG, KRN, TUL* * = extirpated	None	Grows on neutral to subalkaline soils; in the Carrizo Plain it occurs on silty soils. Occupies microhabitats in non-native grassland, valley saltbush scrub, interior Coast Range saltbush scrub and upper sonoran sub-shrub communities from elevations ranging from 200 to 850 feet on the San Joaquin Valley floor, and from 2,000 to 2,600 feet in San Luis Obispo and Santa Barbara counties.
San Mateo thornmint	*Acanthomintha duttonii*	E	**SMT**	None	Restricted to serpentine soils of chaparral and valley and foothill grasslands. Occupies slopes and flats with deep, heavy-clay soil inclusions. The only remaining large pop is in Edgewood County Park. There is an introduced pop. at Pulgas Ridge.
San Mateo woolly sunflower	*Eriophyllum latilobum*	E	**SMT**	None	Found in shaded moist sites on steep grassy or sparsely wooded slopes of serpentine-influenced soil. The remaining occurrences consist of a few hundred plants scattered along 2.5 miles of Crystal Springs Road.
Santa Cruz cypress	*Cupressus abramsiana*	E	**SCZ, SMT**	None	The only grove in San Mateo County grows on Butano Ridge. In

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					Santa Cruz County, groves occur near Bonny Doon, Eagle Rack, and Braken Brae Creek, and between Majors and Laguna Creeks. Predominantly on privately owned lands. Significant portion of the Butane Ridge stand is within Pescadero Creek County Park. past disturbance by construction (Bracken Brae and Majors
Santa Cruz long-toed salamander	*Ambystoma macrodactylum croceum*	E*	**SCZ,** MNT	None	Coastal woodlands and chaparral near ponds and freshwater marshes; spends a significant portion of its life underground in the burrows of small mammals. Currently known from three population clusters (metapopulations) in coastal areas of Monterey and Santa Cruz counties.
Santa Cruz tarplant	*Holocarpha macradenia*	T	**SCZ, ALA*, CCA*, MRN*,** MNT * = extirpated	YES	Grasslands and prairies below 330 feet. Once found in most San Francisco Bay Area counties and south to Monterey County. Development has resulted in the extirpation of all natural populations in the counties surrounding the Bay. The species is now limited to 12 natural occurrences in Santa Cruz and Monterey counties.
Santa Cruz (Ben Lomond) wallflower	*Erysimum teretifolium*	E	**SCZ**	None	Endemic to pockets of sandstone deposits in the Santa Cruz Mountains. Presently known from the area generally bounded by the communities of Ben Lomond, Glenwood, Scotts Valley, and Felton, with one outlying population occurring in the Bonny Doon area, 5 miles west of Felton. One population occurs at Quail Hollow Ranch. All other populations are on privately-owned lands.

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Scott's Valley polygonum	*Polygonum hickmanii*	E	**SCZ**	YES	Occurs on gently sloping to nearly level fine-textured shallow soils over outcrops of Santa Cruz mudstone and Purisima sandstone with the Scotts Valley spineflower and other small annual herbs in patches within isolated relictual grasslands. Elevation of the sites is from 700 to 800 feet. Four colonies are known from two sites about one mile apart at the northern end of Scotts Valley. Occupied habitat comprises less than one acre total.
Scott's Valley spineflower	*Chorizanthe robusta* var. *hartwegii*	E	**SCZ**	YES	Endemic to Purisma sandstone and Santa Cruz mudstone in Scotts Valley in the Santa Cruz Mountains. The entire range of the Scotts Valley spineflower occurs on four parcels, all in private ownership, and covers a range of 1.5 miles in northern Scotts Valley.
Sebastopol meadowfoam	*Limnanthes vinculans*	E	**SON, NAP?**	None	Has not been recorded outside southwestern Cotati Valley. Found in seasonally wet meadows, swales and vernal pools in the Laguna de Santa Rosa, Sonoma Co. Ranges from the city of Graton, east to Santa Rosa, southeast to Scenic Avenue, and southwest to the community of Cunningham, largely surrounding the northern and western perimeter of the city of Sebastopol.
Shortnose sucker	*Chasmistes brevirostris*	E*	**SIS**, MOD	YES	Primarily lake residents that spawn in rivers, streams, or springs associated with lake habitats. Known from the Upper Klamath Lake and its tributaries, Klamath River downstream to Iron Gate Reservoir, Clear Lake Reservoir arid its tributaries, Gerber Reservoir arid its tributaries, the Lost River, and Tule Lake. Gerber Reservoir represents the only habitat with a shortnose

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					sucker population that does not also have a Lost River sucker population. In the Upper Klamath Lake watershed limited to the Sprague and Williamson Rivers; spawning may occur in the Wood River and in Crooked. Spawning has been documented in the Clear Lake watershed.
showy Indian clover	*Trifolium amoenum*	E*	**MRN, NAP*, MEN* SOL*, SON?*, SCL*, ALA*** * = extirpated	None	Historically occurred from the western edge of the Sacramento Valley in Solano County, west and north to Marin and Sonoma counties. Was considered extinct until 1993 when one locality was discovered. A second locality was discovered in 1996. The only known extant population of *T. amoenum* is that near Dillon's Beach. The other population is at the Bodega marine Laboratory.
Siskiyou mariposa lily	*Calochortus persistens*	C	**SIS**	None	Found on metavolcanic rock outcrops with very dry, shallow, well drained soils, growing in open areas near Gunsight Peak in the Klamath National Forest, Siskiyou County.
slender Orcutt grass	*Orcuttia tenuis*	T	**LAK, LAS, PLU, SIS, SAC,** SHA, MOD, TEH	YES	Vernal pools on remnant alluvial fans and high stream terraces and recent basalt flows, annual grasslands and oak woodlands. Primary area of concentration is in the vicinity of Dales, Tehama Co. Secondary area of concentration is Modoc Plateau Vernal Pool Region in Lassen, Plumas, Shasta and Siskiyou Co. A few occurrences in the Lake-Napa and Southeastern Sacramento Valley Vernal Pool Regions.
Smith's blue butterfly	*Euphilotes enoptes smithi*	E	**SLO,** MNT	None	Coastal sand dunes, extending one kilometer inland in a westward direction from the Pacific Ocean (mean higher high tide line), bounded by Del Rey Creek on the south and the Salinas River on

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					the north (MTY Co).
soft bird's-beak	*Cordylanthus mollis ssp. mollis*	E	**SOL, NAP, CCA, MRN*, SON*, SAC*** * = extirpated	Proposed	Found predominantly in the upper reaches of salt grass/pickleweed marshes at or near the limits of tidal action. Endemic to the San Pablo Bay and Suisun Bay area. Currently found in widely scattered populations from Point Pinole and Fagan Slough marsh through the Carquinez Strait to Suisun Bay in Napa, Solano and Contra Costa Counties. Historically found in high tidal marshes along the Petaluma River and Napa River through the Carquinez Strait to Suisun Bay and the San Joaquin-Sacramento River Delta in Marin, Sonoma, Napa, Solano, Contra Costa, and Sacramento Counties.
Solano grass	*Tuctoria mucronata*	E*	**SOL, YOL**	YES	Vernal pools and associated grasslands. Occurs on a former U.S. Air Force Base communication facility (Yolo County Parks Department). Last seen in 1993 at its type locality, Olcott Lake, within the Jepson Prairie Preserve. Only three plants found at a second site in Solano county in 2005.
Sonoma alopecurus	*Alopecurus aequalis var. sonomensis*	E	**MRN, SON**	None	Found in moist soils in freshwater marshes in Sonoma and Marin counties. Three pop's on private property in Sonoma County, five at Point Reyes National Seashore in Marin County, including one on private land within the Seashore.
Sonoma spineflower	*Chorizanthe valida*	E	**MRN, SON*** * = extirpated	None	The only extant populations are in the Point Reyes National Seashore. A naturally occuring population is in the Lundy pasture by Abbott's Lagoon. Two introduced populations are north of

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					Creamery Bay.
Stebbins' morning-glory	*Calystegia stebbinsii*	E	**ELD, NEV**	None	Grows in two localized areas near Pine Hill in western El Dorado Co. Recently discovered in Nevada Co. near the County landfill. It may have been transplanted from El Dorado County by the transport of soil to the Nevada County Sanitary Landfill. Most pop's on private lands.
Suisun thistle	*Cirsium hydrophilum var. hydrophilum*	E	**SOL**	Proposed	Grows in the upper reaches of tidal marshes. It is restricted to Suisun Marsh in Solano Co.
Tahoe yellow cress	*Rorippa subumbellata*	C	**NEV*, PLA, ELD,** Nevada * = extirpated	None	Grows on course sand and cobble deposits in riparian communities and along lakeshore margins. Today, populations exist on the margins of Lake Tahoe in El Dorado and Placer counties and in Nevada's Douglas and Washoe counties.
Tiburon jewelflower	*Streptanthus niger*	E	**MRN**	None	Found on shallow rocky serpentine soils on southwest-facing slopes on the Tiburon Peninsula of Marin Co. Two populations are known.
Tiburon Mariposa lily	*Calochortus tiburonensis*	T	**MRN**	None	Known only from Ring Mountain on the Tiburon Peninsula in Marin County, where it grows on rocky serpentine slopes among annual and perennial herbs and grasses.
Tiburon paintbrush	*Castilleja affinis ssp. neglecta*	T	**MRN, NAP**	None	Grows in serpentine bunchgrass communities on north to west facing slopes. Seven known populations: five in Marin Co. (including three on the Tiburon Peninsula), one in American Canyon in Napa Co., and a small population in Santa Clara Co.

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					Recently discovered populations within the Golden Gate National Recreation Area and east of Anderson Lake extend the known range to western Marin and Santa Clara counties, respectively.
Tidestrom's lupine	*Lupinus tidestromii*	E	**MRN, SON,** MNT	None	Occurs on partially stabilized coastal dunes from the Monterey Peninsula northward to the Pt. Reyes Peninsula. There is an isolated colony on the south bank of the Russian River near its mouth in Sonoma County.
tidewater goby	*Eucyclogobius newberryi*	E	**DEL, HUM, MEN, SON, MRN, SMT, SCZ, SLO, ALA, CCA, NAP,** LAX, MNT, VEN, SBA, ORG, SCL, SDG, SFO	YES	Found primarily in waters of coastal lagoons, estuaries, and marshes. Range from Tillas Slough (mouth of the Smith River, Del Norte County) to Agua Hedionda Lagoon (northern San Diego County).
valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	T	**AMA, BUT, COL, ELD, CCA, LAK, NAP, NEV, PLA, SAC, SJQ, SOL, SUT, YOL, YUB,** CAL, FRE, GLE, KNG, KRN, MAD, MER, MAR, SHA, STA, TEH, TUL, TUO	YES	Elderberry obligate. Current distribution is patchy throughout the remaining riparian forests of the Central Valley from Redding to Bakersfield.

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vernal pool fairy shrimp	*Branchinecta lynchi*	T	**AMA, BUT, COL, NAP, PLA, SAC, ALA, SJQ, SLO, SOL, SUT, YOL, YUB,** FRE, KNG, MAD, MAR, MER, MNT, SBE, SBA, SHA, STA, TEH, TUL, VEN, TUO, SCL, KRN, GLE, CAL,	YES	Vernal pools and associated grasslands. Currently known to occur over a wide range in the southern and Central Valley areas of California.
vernal pool tadpole shrimp	*Lepidurus packardi*	E	**ALA, AMA, BUT, COL, CCA, PLA, SAC, SJQ, SOL, SUT, YOL, YUB,** SBE, FRE, KNG, MAD, MER, STA, TEH, TUL, CAL, ELD, GLE, SHA,	YES	Vernal pools and associated grasslands. Currently distributed across the Central Valley of California and in the San Francisco Bay area.
Vine Hill clarkia	*Clarkia imbricata*	E	**SON**	None	Found in valley grasslands, meadows and chaparral. Currently known from only two populations found in the grasslands on acidic sand in Sonoma Co.
Warner sucker	*Catostomus warnerensis*	T	**SIS**	YES	Known to occur in portions of Crump and Hart Lakes, the spillway canal north of Hart Lake, and portions of Snyder, Honey,

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					Twentymile, and Twelvemile Creeks
water howellia	*Howellia aquatilis*	T	**MEN,** Idaho, Washington, Oregon* and elsewhere * = extirpated	None	Grows in firm consolidated clay and organic sediments that occur in wetlands associated with ephemeral glacial pothole ponds and former river oxbows.
Webber's ivesia	*Ivesia webberi*	C	**LAS, PLU, SIE, NEV**	None	Occurs very infrequently in California in Great Basin scrub and lower montane coniferous forest plant communities. Known populations range from 3400 to 6700 feet elevation, mainly in the 5000 to 6000 foot range.
Western lily	*Lilium occidentale*	E*	**DEL, HUM**	None	Grows at the edges of sphagnum bogs and in forest or thicket openings along the margins of ephemeral ponds and small channels. It also grows in coastal prairie and scrub near the ocean where fog is common. Extremely restricted distribution within 2 miles of the coast from Hauser, Coos County, Oregon to Loleta, Humboldt County. Four sites near Crescent City, California. On-going captive propagation program in Humboldt County and in Coos Bay, Oregon.
western snowy plover	*Charadrius alexandrinus nivosus*	T	**Coastal California, SF Bay** **ALA, DEL, MEN, HUM, MRN, NAP, SMT, SOL, SON,**	YES	Pacific coast population is defined as those individuals that nest beside or near tidal waters, and includes all nesting colonies on the mainland coast, peninsulas, offshore islands, adjacent bays and estuaries from southern Washington to southern Baja California, Mexico. Habitats used by nesting and non-nesting birds include

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			SCZ, SLO, YOL, LAX, MNT, SBA, ORG, RIV, SBD, SCL, SDG, SFO, VEN		sandy coastal beaches, salt pans, coastal dredged spoils sites, dry salt ponds, salt pond levees and gravel bars.
Western yellow-billed cuckoo	*Coccycus americanus*	C	**BUT, YUB, SUT, SAC, MEN, SJQ, COL, YOL, SCZ, SIS, SLO,** INY, KRN, LA, MNO, MNT, SBA, SBD, SBE, VEN, GLE, IMP, MOD, RIV, SDG, SHA,	None	In California, breeding populations of greater than five pairs which persist every year in California are currently limited to the Sacramento River from Red Bluff to Colusa and the South Fork Kern River from Isabella Reservoir to Canebrake Ecological Reserve. Other sites where small populations of cuckoos (<5 pairs) breed or possibly breed (but not necessarily every year) are: The Feather River from Oroville to Verona, Butte, Yuba and Sutter counties; the Prado Flood Control Basin, San Bernardino and Riverside counties; the Amargosa River near Tecopa, Inyo Co.; the Owens Valley near Lone Pine and Big Pine, Inyo Co.; the Santa Clara River near Santa Clarita, Los Angeles Co.; the Mojave River near Victorville, San Bernardino Co.; and the Colorado River from Needles, San Bernardino Co. to Yuma, Imperial Co.
white-rayed pentachaeta	*Pentachaeta bellidiflora*	E*	**MRN*, SMT, SCZ*** * = extirpated	None	Grows in serpentine bunchgrass habitat. Historically, it was known from at least nine sites in Marin, San Mateo, Santa Cruz and Monterey counties. Now known from only one confirmed location in San Mateo County, in the "Triangle" area and adjacent Edgewood County Park.

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white sedge	*Carex albida*	E*	**SON**	None	Thought to be extinct until 1987, when a single population was found in a sphagnum bog in Sonoma Co. The species has been extirpated from its four historical populations, all in Sonoma Co. The single population, which is located on private land, has approximately 800 to 1,000 plants.
yellow larkspur	*Delphinium luteum*	E	**SON, MRN*** * = extirpated	YES	Grows in rocky areas within coastal scrub plant community, including areas with active rock slides, near the town of Bodega Bay in Sonoma Co. *The historic range is Sonoma and Marin counties.
Yreka phlox	*Phlox hirsuta*	E	**SIS**	None	Known only from two locations on serpentine slopes in Siskiyou County. A third location, near Etna Mills, California, has been searched, but no plants or habitat has been found since 1930.
Yosemite toad	*Bufo canorus*	C	**ALP,** ELD, AMA, CAL, FRE, MAD, MAR, TUO, MNO	Non	Preferred habitats are wet mountain meadows and lake shores, nestled among lodgepole pines. The current range extends from Ebbetts Pass in Alpine County to south of Kaiser Pass and Evolution Lake, Fresno County. The Yosemite toad commonly occurs at elevations between 8,000 and 10,000 feet. More than 90 percent of Yosemite toad habitat occurs within U.S. Forest Service wilderness areas and on National Park Service lands.
Zayante band-winged grasshopper	*Trimerotropis infantilis*	E	**SCZ**	YES	Restricted to the Zayante sand hills ecosystem endemic to inland marine sand deposits in the Santa Cruz Mountains. Narrowly distributed, known only from seven patches of sand parkland.

Primary Sources: http://ecos.fws.gov/species_profile/; http://www.fws.gov/cno/arcata/es/; http://www.fws.gov/sacramento/es/spp_info.htm; http://www.fws.gov/ventura/es/es_index.html; http://www.dfg.ca.gov/; and http://plants.usda.gov/.

APPENDIX A

Listed, proposed and candidate species addressed in the Programmatic Biological Assessment for Projects Funded by the Federal Emergency Management Agency (FEMA).

This list only includes species within the 30 counties included in the FEMA-1628-DR disaster declaration. FEMA-1628-DR-CA counties are in BOLD font

Species indicated with an asterisk in the "Status" column (*e.g.*, E*) are considered to be "critically" endangered species as defined previously.

COUNTY ABBREVIATIONS USED IN APPENDIX A

Alameda	**ALA**	Inyo	**INY**	Napa	**NAP**	San Luis	**SLO**	Trinity	**TRI**
Alpine	**ALP**	Kern	**KRN**	Nevada	**NEV**	San Mateo	**SMT**	Tulare	**TUL**
Amador	**AMA**	Lake	**LAK**	Kings	**KNG**	Santa Barbara	**SBA**	Tuolumne	**TUO**
Butte	**BUT**	Lassen	**LAS**	Orange	**ORG**	Santa Clara	**SCL**	Ventura	**VEN**
Calaveras	**CAL**	Los Angeles	**LAX**	Placer	**PLA**	Santa Cruz	**SCZ**	Yolo	**YOL**
Colusa	**COL**	Madera	**MAD**	Plumas	**PLU**	Shasta	**SHA**	Yuba	**YUB**
Contra Costa	**CCA**	Marin	**MRN**	Riverside	**RIV**	Sierra	**SIE**		
Del Norte	**DEL**	Mariposa	**MAR**	Sacramento	**SAC**	Siskiyou	**SIS**		
El Dorado	**ELD**	Mendocino	**MEN**	San Benito	**SBE**	Solano	**SOL**		
Fresno	**FRE**	Merced	**MER**	San Bernadino	**SBD**	Sonoma	**SON**		
Glenn	**GLE**	Modoc	**MOD**	San Diego	**SDG**	Stanislaus	**STA**		
Humboldt	**HUM**	Mono	**MNO**	San Francisco	**SFO**	Sutter	**SUT**		
Imperial	**IMP**	Monterey	**MNT**	San Joaquin	**SJO**	Tehama	**TEH**		

Primary Sources: http://ecos.fws.gov/species_profile/; http://www.fws.gov/cno/arcata/es/; http://www.fws.gov/sacramento/es/spp_info.htm; http://www.fws.gov/ventura/es/es_index.html; http://www.dfg.ca.gov/; and http://plants.usda.gov/.

APPENDIX B

Appendix B

General Conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats

1. To determine the likelihood that a federally-listed species may be present in the areas that may be directly or indirectly affected by project activities, a qualified biologist will conduct a thorough review of all existing data regarding federally-listed species and their habitats prior to the implementation of any project. This review will include not only a review of the California Department of Fish and Game's California Natural Diversity Database (CNDDB), but all other sources of information and data available within the public domain including, but not limited to, reports submitted to the Service, California Department of Fish and Game, or other public agencies; peer-reviewed publications in scientific journals, internet resources such as California Native Plant Society website, books or other published literature, and all other sources as appropriate. FEMA will consider that a federally-listed species is likely to occur on a project site if **a)** it is within the dispersal distance of a documented sighting of the species, and **b)** suitable habitat is present in the area.

2. To determine whether suitable habitat is present, and to further inform determinations of the likelihood that a federally-listed species occurs in areas that may be directly or indirectly affected by project activities, a qualified, Service-approved biologist will conduct pre-activity surveys for federally-listed species and habitats prior to the implementation of any project, unless a species has already been assumed to be present, then no surveys are necessary. Surveys will follow the most recently available Service-approved guidance and they will be conducted during the most appropriate times of the year to identify a species' presence. For example, plant surveys will be conducted during the flowering period following the most recently available, Service-approved survey guidance; reptile and amphibian surveys will be conducted during the animal's active periods following the most recently available, Service-approved survey guidance, not during their aestivation periods, *etc.* **If surveys are conducted outside of a period when a species is most likely to be identified, and the project site meets criteria under item 1 (a) and (b) above, the project will not qualify for a "not likely to adversely affect" determination.**

3. Project proponents will ensure that, in addition to the general conservation measures proposed herein, that all species-specific conservation measures outlined in Appendix C are implemented for

Appendix B

General Conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats

each federally-listed species and their habitats at each project site, as appropriate;

4. A qualified, Service-approved biological monitor will be present on site during all activities related to the project. The biological monitor will provide guidance to the project proponents and crew about federally-listed species and their habitats. The biological monitor will monitor all activities to ensure that no federally-listed species is harassed, killed, or injured and to ensure that the project otherwise conforms to the conservation measures outlined throughout this document and the subsequent programmatic consultation documents. The biological monitor will have the authority to stop any aspect of the project that will result in unauthorized take of federally-listed species;

5. Project proponents will ensure that all work will be conducted in an area, from a location, or in such a manner that it will not directly or indirectly kill or injure a listed species, will not intentional or negligently harass a listed species to such an extent as to significantly disrupt normal behavioral patterns, or will not adversely modify listed species habitats. 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;

6. 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 shall avoid and limit disturbance to federally-listed species and their habitats to the maximum extent practicable. When possible, existing ingress or egress points will be used and the contours of the project site will be returned to pre-construction condition or better;

7. Projects proponents will, to the maximum extent practicable, reduce the amount of disturbance at a site to the absolute minimum necessary to accomplish the project. Wherever practicable, existing vegetation will be salvaged from the proposed 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

Appendix B

General Conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats

movement of the soil into federally-listed species habitats. All disturbed soils will undergo erosion control treatment prior to the rainy season and after construction is terminated. Treatment typically includes temporary seeding with native species and sterile straw mulch. All topsoil will be replaced in a manner to as closely as possible represent pre-disturbance conditions. This is especially necessary for listed plants to preserve the integrity of the seed contained within the topsoil;

8. Project proponents will ensure that project sites are re-vegetated with locally-acquired sources of native seeds and plants in a manner that is not likely to adversely affect listed species and will return the site to at least its pre-existing condition or better. Plantings will be done during the optimal season for the species being planted and, if necessary, an irrigation system will be installed to ensure establishment of vegetation. An 80% or more survival rate over a period of 3-5 years for new plantings will be the target. Invasive exotic plant species will be controlled to the maximum extent practicable to accomplish the re-vegetation effort. Chemical control of invasive exotic plant species will be conducted by a certified pesticide applicator per labeled directions and all other federal, state, and local laws and regulations;

9. Projects being implemented within habitat known to support plant species or species that use underground retreat, escape, hibernacula, and/or aestivation areas (*e.g.,* snakes and amphibians, small mammals, burrowing owls, *etc.*) will require that vehicles and equipment be operated in a manner that does not result in the death or injury of an individual plant or animal and in a manner that does not unduly compact or disturb the soil. For example, temporarily removing topsoil in an area just large enough to allow heavy equipment access to a site (*e.g.,* a levee repair site) after the flowering and seed set period, then returning the topsoil to the area once the equipment work is completed **This measure is not appropriate in Point Arena mountain beaver habitat**;

10. For projects conducted in areas where species are known to use underground burrows as escape habitat, hibernacula, aestivation areas, or other purposes of retreat, project proponents will completely encircle the project area with exclusionary fencing fitted with one-way exit holes and buried a few inches below ground level. This fencing will

Appendix B

General Conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats

allow species to passively leave the project site while at the same time preventing them from re-entering the work zone. Exclusionary fencing will be installed at least six weeks prior to the implementation of the project and it will be checked frequently to ensure the fencing is intact and functioning properly. The fencing will be maintained, in place, throughout the duration of the project, to prevent species from re-entering the project site until all work activities have ceased. **This measure is not appropriate in Point Arena mountain beaver habitat**;

11. All standardized Best Management Practices (*e.g..,* per Regional Water Quality Control Boards, the California Stormwater Best Management Practice Handbooks, *etc.*) will be implemented for all projects, as appropriate to each project site;

12. Project proponents will ensure that sediment-control devices are installed and maintained correctly. For example, sediment will be removed from sediment controls once the sediment has reached one-third (1/3) of the exposed height of the control. The devices will be inspected frequently (*e.g.,*daily) to ensure 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 on site in an appropriate, safe, approved area, or off site at an approved disposal site;

13. Project proponents will consider design factors and other recommendations detailed in the most recently available publications (*e.g.*, NMFS stream crossing criteria, California Salmonid Stream Habitat Restoration Manual, *etc.*) when undertaking projects such as bridge or culvert replacement, for example, on fish-bearing streams (particularly anadromous fish);

14. Project proponents shall exercise every reasonable precaution to protect federally-listed species and their habitats from pollution due to fuels, oils, lubricants, and other harmful materials. 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 federally-listed species or their habitats. Spills, leaks, and other problems of a similar nature will be resolved immediately to prevent unnecessary effects to listed species and their habitats. A plan

Appendix B

General Conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats

for the emergency clean up of any spills of fuel or other material will be available on site and adequate materials for spill cleanup will be maintained on site;

15. Project proponents shall exercise every reasonable precaution to protect federally-listed species and their habitats from construction by-products and pollutants such as construction chemicals, fresh cement, saw-water, or other deleterious materials. Water containing mud, silt, concrete, *etc*. from construction activities shall be treated by filtration, retention in a settling pond, *etc*. Fresh cement or concrete shall not be allowed to enter flowing water of streams. Construction pollutants will be collected and transported to an authorized disposal area, as appropriate, and per all federal, state, and local laws and regulations;

16. All hazardous material will be stored in properly designated containers in a storage area with an impermeable membrane between the ground and the hazardous material. The storage area will be encircled by a berm to prevent the discharge of pollutants to ground water or runoff into federally-listed species habitats. A plan for the emergency clean up of any hazardous material will be available on site and adequate materials for spill cleanup will be maintained on site;

17. All construction material, wastes, debris, sediment, rubbish, vegetation, trash, fencing, *etc*. will be removed from the site once the project is completed and transported to an authorized disposal area, as appropriate, and per all federal, state, and local laws and regulations;

18. All concrete or other similar rubble shall be free of trash and reinforcement steel. No petroleum-based products such as asphalt will be used as a stabilizing material (*i.e.*, riprap);

APPENDIX C

Appendix C

Species-specific information and conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats.

PLANTS

Species	Proposed Conservation Measures
All federally-listed plants	? Consult a Service-approved botanist with expertise and permits specific to the species of concern; ? Complete surveys per the most recently available Service-approved survey guidance, unless a species has already been assumed to be present, then no surveys are necessary; ? If a species or habitat is present, follow all of the general conservation measures as described in Appendix B, and any species-specific conservation measures described in this appendix (*e.g.*, vernal pools); ? An ESA determination will recognize both direct and indirect affects including changes in hydrology, availability of pollinators, harm and injury of individual plants, and other factors that support the ecological functioning of the habitat. Federally listed plants are legally designated as threatened or endangered; however, some species are more highly endangered than others. For example, baker's larkspur, showy Indian clover, Solano grass, and others would be considered "critically" endangered due to their extremely low population numbers and their extremely restricted ranges. Some federally-listed plant species are annual plants, meaning the plant completes its entire lifecycle in one growing season. Other federally-listed plant species are perennial plants that return year after year until they reach full maturity. Due to the differences in life strategies and their federally-listed statuses, all general conservation measures, as well as species-specific strategies that are based on a site-specific, case-by-case basis should be implemented in order to avoid jeopardizing the continued existence of federally-listed plant species.

Appendix C

Species-specific information and conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats.

VERNAL POOLS

Species	Proposed Conservation Measures
All federally-listed vernal pool plant and invertebrate species **For example:** ? **Solano grass** ? **Colusa grass** ? **Orcutt grasses** ? **Navarettias** ? **Goldfields** ? **Meadowfoams** ? **Tadpole shrimp** ? **Fairy shrimp**	? Consult a Service-approved biologist with expertise and permits specific to the species of concern; ? Complete surveys per the most recently available Service-approved survey guidance, unless a species has already been assumed to be present, then no surveys are necessary; ? Avoid all disturbances of pools and their local contributing watersheds (*i.e.,* the immediate adjacent upland habitats) by maintaining an approximate 250-foot buffer around the pools during the wet season (*i.e.*, whenever water is present or the soil in the pool is moist); ? During the dry season, vehicles and equipment may occasionally drive through (preferably only around or across the edges) the vernal pools if no other route of travel is possible, provided that the vernal pool edges are flagged ahead of time and the traveling does not unduly compact or disturb the soil. No designated access routes or haul routes will be established through any vernal pool; ? Projects occurring in areas where vernal pool plant species (*e.g., Orcuttia* sp.) occur will avoid all disturbances to vernal pools until after the plants have completed their reproductive cycle. *Orcuttia* species and others (*e.g.*, Hoover's spurge (*Chamaesyce hooveri*)) grow and bloom during the dry season, after an aquatic phase, and then flowering in to mid-summer (June-July) when everything else is dry. Vernal pools and swales are ephemeral (seasonal) wetlands that typically form in shallow depressions underlain by a soil substrate that restricts the percolation of water. These depressions fill with rainwater and runoff from adjacent upland areas during the winter and may remain inundated until spring or early summer, sometimes filling and emptying more than once during the wet season. Vernal pools and swales are frequently clustered into assemblages known as vernal pool complexes. Individual pools within a vernal pool complex are mutually interdependent in supporting federally-listed vernal pool species; when a species is extirpated from an individual pool, other pools in the complex may serve as sources for a species re-colonization. Upland habitat and swales around and within a vernal pool complex are essential to the hydrological and biological integrity of the complex.

Appendix C

Species-specific information and conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats.

AMPHIBIANS

Species	Proposed Conservation Measures
For example: ? **California red-legged frog** ? **California tiger salamander** ? **Mountain yellow-legged frog** ? **Foothill yellow-legged frog** ? **Santa Cruz long-toed salamander** ? **Yosemite toad** **NOTE: Many of the same conservation measures that are applicable to amphibians, especially stream-dwelling amphibians such as the foothill yellow-legged frog, are also applicable to a federally-listed invertebrate species, the California freshwater shrimp.**	? Consult a Service-approved biologist with expertise and permits specific to the species of concern; ? Complete surveys per the most recently available Service-approved survey guidance, unless a species has already been assumed to be present, then no surveys are necessary; ? Avoid all disturbances of ponds, streams, lakes, and other wetland or water courses, and their immediate adjacent upland habitats, that provide suitable breeding and foraging habitat for amphibians by maintaining an approximate 100-m buffer around these areas; ? Hand clear vegetation in areas where amphibians are suspected to occur and install exclusionary fencing with one-way exit funnels per Service-approved guidance at least one month before the start of the project to allow species to passively leave the area and to prevent species from entering work areas; or ? If appropriate, obtain the services of a section 10(a)(1)(A) permitted biologist to conduct pre-activity trapping per Service-approved guidance at the project site to remove all individuals from the work areas. Any questions regarding the relocation of individuals from the project area should be directed to the appropriate Service jurisdictional field offices; ? Cover all construction-related holes to prevent entrapment of individuals; ? Schedule work at a time when it is least likely to affect amphibian species, *i.e.*, after the migration period, after the breeding season if working in a wetland, while amphibians are concentrated at a wetland if working in upland areas, *etc.* Amphibians can travel distances of more than one mile across upland habitat. For migrational species, males typically arrive at breeding sites first, shortly after the first rains of the year. Migration is typically at night when it is raining. Courtship and mating takes place in the water. Amphibians do not tend their eggs; females leave shortly after the eggs are laid; males may linger for up to a month to find additional mates. Eggs hatch within a month after egg-laying and larvae remain in the water until metamorphosis (some may remain as larvae over winter). Amphibians, especially salamanders, disperse from the breeding site into upland habitats to seek refugia in burrows or other dark, moist places. They may remain underground in upland areas for many years before returning to the same breeding site where they were born to reproduce. Reproductive cycle is approx. November to July.

Appendix C

Species-specific information and conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats.

REPTILES

Species	Proposed Conservation Measures
For example: ? **Alameda whipsnake** ? **Giant garter snake** ? **San Francisco garter snake** ? **Blunt-nosed leopard lizard**	? Consult a Service-approved biologist with expertise and permits specific to the species of concern; ? Complete surveys per the most recently available Service-approved survey guidance, unless a species has already been assumed to be present, then no surveys are necessary; ? Avoid all disturbances of hibernacula and aestivation areas (*e.g.*, rocks, burrows, logs, brush piles, *etc.*) during cold or cool-weather periods when reptiles are inactive; ? Hand clear vegetation in areas where reptiles are suspected to occur and install exclusionary fencing with one-way exit funnels per Service-approved guidance at least six weeks before the start of the project to allow species to passively leave the area and to prevent species from entering work areas; or ? If appropriate, obtain the services of a section 10(a)(1)(A) permitted biologist to conduct pre-activity trapping per Service-approved guidance at the project site to remove all individuals from the work areas. Any questions regarding the relocation of individuals from the project area should be directed to the appropriate Service jurisdictional field offices; ? Cover all construction-related holes to prevent entrapment of individuals; ? Schedule work at a time when it is least likely to affect reptilian species, *i.e.*, approximately May to October when direct mortality is expected to be lessened because reptiles can move to avoid danger. Federally-listed reptiles are highly varied in their biology and ecology; ranging from the highly aquatic garter snakes to chaparral/grassland-dwelling Colubrid racers to lizards that live in xeric, alkali scrub/grassland landscapes. In general, however, reptiles are cold-blooded animals that rely on external sources such as the sun to warm themselves. They are predators that are tied to habitats that support their preferred prey items. Giant garter snakes are typically found in wetlands, rice fields, canals, and other watercourses where fish and amphibians are present or nearby. San Francisco garter snakes are found in coastal wetlands with sufficient numbers of frogs. Alameda whipsnakes are found in scrub/grassland areas where they feed primarily on lizards. Lizards themselves feed primarily on insects or other small invertebrates, reptiles, *etc.* All federally-listed reptiles rely heavily on upland habitat areas.

Appendix C

Species-specific information and conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats.

INSECTS

Species	Proposed Conservation Measures
For example: ? **Butterflies** ? **Delta green ground beetle** ? **Mt. Herman June beetle** ? **Valley longhorn elderberry beetle** ? **Zayante band-winged grasshopper**	? Consult a Service-approved biologist with expertise and/or permits specific to the species of concern; ? Complete surveys per the most recently available Service-approved survey guidance, unless a species has already been assumed to be present, then no surveys are necessary; ? Avoid all disturbances of breeding, foraging, and dispersal habitat where reproductive adults, eggs, or larvae may be present. For example: o **bay checkerspot butterfly**--serpentine uplands with *Plantago erecta*; o **callippe silverspot butterfly**--uplands with *Viola pedunculata*; o **Myrtle's silverspot butterfly**--coastal dunes and prairies; o **Smith's blue butterfly**--dunes, grassland, chaparral with host buckwheat plants *Eriogonum latifolium* and *Eriogonum parvifolium*; o **Mt. Hermon June beetle**--Zayante sand soils with *Pinus ponderosa* and *Arctostaphylos silvicola* in the Felton USGS Quadrangle; o **Zayante band-winged grasshopper**--Zayante sand soils, as described above o **Delta green ground beetle**--vernal pools and associated grasslands in the Central Valley

Appendix C

Species-specific information and conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats.

INSECTS (continued)

Species	Proposed Conservation Measures
For example: ? **Butterflies** ? **Delta green ground beetle** ? **Mt. Herman June beetle** ? **Ohlone tiger beetle** ? **Valley longhorn elderberry beetle** ? **Zayante band-winged grasshopper**	? Schedule work at a time when it is least likely to affect invertebrate species, *e.g.*, o **Butterflies**--avoid egg laying and larval periods for all species o **Valley elderberry longhorn beetle**--conduct projects outside of the emergent period and prevent disturbances within 100 feet of elderberry shrubs (March 15 thru June15), most preferable to conduct projects during the elderberry bush's dormant period (Nov. 1 thru Feb 15), disturbances may occur within 20 feet of the elderberry shrubs during this period; o **Mount Hermon June beetle**--conduct projects between Sept. and Apr. (primary adult activity period is mid-May through mid-Aug.). If ground-disturbing projects must be conducted between mid-May and mid-Aug. in areas with Zayante sand soils, project proponents should cover disturbed/exposed soils each evening to preclude dispersing beetles from burrowing into the project area at night and being injured or killed the following day by construction activities; o **Zayante band-winged grasshopper**—Limited information available on the life cycle of this species. The flight season for adults extends from late May through October with peak activity during July and August. Avoiding Zayante sand soils completely during this period will reduce adverse effects on this species; o **Delta green ground beetle--** Limited information available on the life cycle of this species. Adults are active Feb. thru mid-May; then enter diapause to survive the dry summers. Species is extremely range restricted which will reduce most potential for adverse effects. Federally-listed insect species tend to be short-lived and, in general, they are associated with very specific habitat types or, more specifically, with very specific plant species and tend to be very restricted in their ranges. Any disruption of their habitat or host plants during their reproductive cycle can have serious adverse effects on subsequent generations and future population numbers.

Appendix C

Species-specific information and conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats.

MAMMALS

Species	Proposed Conservation Measures
For example: ? **San Joaquin kit fox** ? **Tipton kangaroo rat** ? **Giant kangaroo rat** ? **Morro Bay kangaroo rat** ? **Riparian brush rabbit** ? **Riparian woodrat** ? **Salt marsh harvest mouse**	? Consult a Service-approved biologist with expertise and/or permits specific to the species of concern; ? Complete surveys per the most recently available Service-approved survey guidance, unless a species has already been assumed to be present, then no surveys are necessary; ? Avoid all disturbances of kit fox dens and kangaroo rat colonies at all times, ? Avoid all disturbances of riparian habitat at all times within the range of the rabbit and the woodrat; ? Avoid all permanent disturbances of habitat within the mid- to upper reaches of dense pickleweed (*Salicornia virginica*) stands in tidal and diked coastal salt marshes; ? Install exclusionary fencing per Service-approved guidance before the start of the project to prevent species from entering work areas; and ? If appropriate, obtain the services of a section 10(a)(1)(A) permitted biologist to conduct pre-activity trapping per Service-approved guidance at the project site to remove all individuals from the work areas; ? Schedule work at a time when it is least likely to affect mammalian species, *i.e.*, after the breeding season; Federally-listed mammals are, generally, more mobile than other federally-listed species and, thus, are far more capable of avoiding direct mortality by construction equipment when the appropriate conservation measures are employed. However, their mobility makes them also more capable of entering a work site. Small, temporary affects to habitat are less likely to jeopardize the continued existence of a species whereas permanent destruction of burrows, dens, dense riparian vegetation, or pickleweed is more likely to seriously adversely affect these species.

Appendix C

Species-specific information and conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats.

BIRDS

Species	Proposed Conservation Measures
Northern Spotted Owl	? Consult a Service-approved biologist with expertise and permits specific to the species of concern; ? Complete surveys per the most recently available Service-approved survey guidance, unless a species has already been assumed to be present, then no surveys are necessary; ? Avoid removing or intentionally damaging any known nest trees and associated screen trees; ? Avoid degrading or removing habitat in a nest grove; ? Avoid habitat modification in suitable nesting habitat and in an area within 1,000 feet of an occupied nest tree between February 1 and September 15.
Marbled Murrelet	? Consult a Service-approved biologist with expertise and/or permits specific to the species of concern; ? Complete surveys per the most recently available Service-approved survey guidance, unless a species has already been assumed to be present, then no surveys are necessary; ? Avoid activities in occupied habitat from March 24 through September 15 within the period two hours after sunrise and two hours before sunset; ? Avoid removing or intentionally damaging any trees with potential nesting platforms or removing any nest platforms; ? Avoid removing screen trees around potential nest trees and potential nesting platforms; ? A qualified biologist will verify that trees to be removed are not suitable for nesting or screen trees; ? Avoid all habitat modification from March 24 through September 15 in unsurveyed or occupied nesting habitat; ? All trash will be stored in predator-proof containers and transported off-site at the end of each work day.

Appendix C

Species-specific information and conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats.

BIRDS (continued)

Bald Eagle	? Consult a Service-approved biologist with expertise and/or permits specific to the species of concern; ? Complete surveys per the most recently available Service-approved survey guidance, unless a species has already been assumed to be present, then no surveys are necessary; ? Avoid activities from January 1 thru August 31 within one-half (0.5) mile or line-of-sight, whichever is greater, of an occupied nest; ? Avoid removing known nest trees, screen trees around known nest trees, perch trees, or roost trees.
Western snowy plover	? Consult a Service-approved biologist with expertise and/or permits specific to the species of concern; ? Complete surveys per the most recently available Service-approved survey guidance, unless a species has already been assumed to be present, then no surveys are necessary; ? If a project occurs from October 1 through February 15, daily surveys will be conducted each morning prior to staring work. The area surveyed will include the work area and an additional 100 yard zone around the work area. If a wintering flock of five (5) or more adult plovers are present within the survey area, then no work can be conducted. ? If a project occurs in occupied habitat between February 15 and September 21, daily surveys will be conducted each morning prior to starting work. The area surveyed will include the work area and an additional 100 yard zone around the work area. If a plover [adult, juvenile (fledged young of that year), or chick (flightless usually less than 28 days old)], nest, or scrape is located within the surveyed area, then no work will occur. If chicks are present on the beach segment, no work will be conducted regardless of the survey results. If no nests are located by August 21, daily morning surveys will be discontinued provided there are no chicks on the beach segment. ? Vehicle use in suitable habitat will be minimized to the maximum extent practicable. Vehicles will remain on the wet sand and speeds will be limited to 5 mph. There will be no night driving or driving during periods of diminished visibility. Areas of the wrack will be avoided. A Service-approved, on-site biological monitor will be present if vehicle are traveling near plovers to prevent accidental injury or mortality. ? All trash will be stored in predator-proof containers and transported off-site at the end of each work day.

Appendix C

Species-specific information and conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats.

BIRDS (continued)

California brown pelican	? Consult a Service-approved biologist with expertise and/or permits specific to the species of concern; ? Complete surveys per the most recently available Service-approved survey guidance, unless a species has already been assumed to be present, then no surveys are necessary; ? Disturbance at night roosts will be avoided by: 1) working during daylight hours - avoiding night time and low light conditions; 2) providing a 300 yard buffer zone if work must be conducted at night; and 3) directing lights away from roost area. ? Project access will avoid night roosts and day roosts to the extent practicable. Over-flights of roosts will be avoided completely or will maintain and altitude of at least 500 feet above roosts, and offset by at least 300 yards.
Least bell's vireo	? Consult a Service-approved biologist with expertise and/or permits specific to the species of concern; ? Complete surveys per the most recently available Service-approved survey guidance, unless a species has already been assumed to be present, then no surveys are necessary; ? Avoid removing, degrading, or otherwise damaging all riparian habitat and other suitable vireo habitats in areas known or suspected to support the species; ? Earthmoving activities and/or habitat restoration activities will be conducted between approximately September 1 and March 14 (dates must be adjusted to local area conditions) to avoid impacts to least Bell's vireos during the breeding season ? In the areas where earthmoving activities will occur, all mature willows over 30 feet tall will be avoided to the maximum extent feasible. If avoidance is not feasible, the trees will be translocated to another area within the project site or pushed over and left on site to supplement woody debris and add to the overall habitat structure. Outside of the areas where earthmoving activites will occur, impacts to existing onsite willow woodland, sand bar willow scrub, and mule fat scrub will be avoided to the greatest extent feasible; ? Existing jurisdictional wetlands with suitable vireo habitat will be avoided; ? Construction activities will avoid areas of habitat and stay on existing roads and developed areas to the extent feasible, except where necessary to complete project objectives;

Appendix C

Species-specific information and conservation measures for FEMA-funded actions with the potential to affect federally-listed species or their habitats.

FISH

Species	Proposed Avoidance and Minimization Measure
Delta smelt	**Not likely to adversely affect:** All in-water work shall be confined to a work window of **August 1 through November 30** and to areas in excess of 3 meters (10 feet) at mean high water that have been disturbed in the past, and where no woody riparian or aquatic vegetation has become re-established. In areas where no previous disturbance has occurred (i.e., no riprap previously placed), FEMA will initiate formal ESA section 7 consultation with the Service on a case-by-case basis. This window has been identified based on the presence of various life-stages of delta smelt migrating through the Delta. However, because these species do not adhere strictly to this time period, new information from the various in-Delta monitoring programs may be used to determine presence or absence of the species of concern and modify allowable time-windows when in-water work may be conducted. Any time-window modifications must be approved by the Service prior to project implementation.
Green sturgeon	**Requires ESA section 7 consultation with NMFS**
Lahontan cutthroat trout	Extremely limited geographic range--- **Requires ESA section 7 consultations with the Service on all actions within the known range of this species.**
Paiute cutthroat trout	Rarest trout subspecies--- **Requires ESA section 7 consultations with the Service on all actions within the known range of this species.**
Steelhead	**Requires ESA section 7 consultation with NMFS**
Salmon species	**Requires ESA section 7 consultation with NMFS**
Lost River and shortnose suckers	"Critically" endangered due to extremely limited geographic range and small population sizes--- **Requires ESA section 7 consultations with the Service on all actions within the known range of these species.**
Tidewater goby	The only species in the genus *Eucyclogobius*. It is almost unique among fishes along the Pacific coast in its restriction to waters with low salinities in California's coastal wetland habitats. **Requires ESA section 7 consultations with the Service on all actions within the known range of this species.**

APPENDIX D

Appendix D

Potential bioengineering practices for FEMA-funded actions with the potential to affect federally-listed species or their habitats

Bioengineering practices are designed and implemented in a manner appropriate to the specific project site and the activity occurring at the site. Selection of bioengineering practices should be made based on the scope and magnitude of the project, specific site conditions, weather, native flora, and material availability. One or more bioengineering practice may be required to accomplish the goal. The California Department of Fish and Game's 1998 *California Salmonid Stream Habitat Restoration Manual* is an excellent resource for bioengineering practices.

Typical bioengineering practices include:

- Brushlayering - used to stabilize shallow slopes; incorporates willow or other branches with soil backfill. Live brush layers act as horizontal drains and improve slope stability by providing tensile strength and natural re-vegetation;

- Brush Mattress – typically formed of live willows and provides a protective covering to the slope that will root and stabilize the slope;

- Brush walls/bundles – branches bound together to create a log-like structure;

- Hand Seeding or Hydro-seeding– broadcasting mixtures of native grass seeds on disturbed soils to minimize erosion and the potential for soil to become airborne or waterborne. Hydro-seed mix is generally applied with a tackifying agent at a rate of at least 2 tons/acre and/or based on manufacturer's recommendations. The tackifying agent is a hydraulic matrix which when applied, and upon drying, adheres to the soil to form a 100% cover which is biodegradable, promotes vegetation, and prevents soil erosion. The hydro-seed mix is not applied before, during, or immediately after rainfall so that the matrix has an opportunity to dry 24 hours after installation;

- Incorporation of large woody debris (LWD) – LWD is generally defined as six inches in diameter or larger and at least ten feet long. It is tailored to the specific requirements of the project, site conditions, and the forces acting at the site;

- Live staking – the planting of live cuttings into the ground so that the stake (cutting) will take root and grow. These stakes are typically cuttings of willow, but may include other species such as cottonwood (*Populus* sp.) that will sprout. Stakes need to be placed in

Appendix D

Potential bioengineering practices for FEMA-funded actions with the potential to affect federally-listed species or their habitats

water after they are cut, and until they are used. Willow stakes must be long enough to drive into ground deep enough to reach moisture, or they should be irrigated until established.

These typical bioengineering practices are used in conjunction with other erosion control BMPs, such as coffer dams, well-anchored silt fences, coir fabric or rolls, energy dissipaters, and erosion control blankets. Typical activities that incorporate bioengineering practices include bank repair, stabilization or armoring, construction or modification of a water crossing, repair or realignment of roads, trails, utilities or rail lines, and re-vegetation of disturbed areas. For example, large woody debris, brush layering, live staking and hand seeding may be used with boulders for stream bank stabilization by constructing a rootwad revetment that places large material at the bottom of the slope for stabilization to withstand high water flow forces. The materials become smaller as the construction moves upslope where forces are expected to be less. Live willow staking also may be used in conjunction with riprap, where bioengineering practices alone will not withstand shear forces of the water in the stream channel, as under a bridge. Willow stakes should be placed as the rock is placed, not after when it will be difficult to place them deep enough.

APPENDIX E

Appendix E

Designated and proposed critical habitats that are addressed in the Programmatic Biological Assessment for projects funded by the Federal Emergency Management Agency (FEMA).

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SPECIES	SCI. NAME	STATUS	COUNTIES	CRITICAL HABITAT	PRIMARY CONSTITUENT ELEMENTS (PCEs)
Alameda whipsnake	*Masticophis lateralis euryxanthus*	T	**ALA, CCA,** SCL, SJQ	**Proposed (October 2005)** Six units totaling approximately 203,342 acres	(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 occurring at elevations from sea level to approximately 3,850 ft (1,170 m). Such scrub/shrub vegetation within these series form a pattern of open and closed canopy which is used by the Alameda whipsnake to provide shelter from predators, temperature regulation by providing 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 birds. (2) Woodland or annual grassland plant communities contiguous to lands containing PCE 1: Woodland or annual grassland vegetation series comprised of one or more of the following: blue oak, coast live oak (Quercus sp.), California bay (Umbellularia californica), California buckeye, and California annual grassland vegetation . This mosaic of vegetation supports a prey base consisting of western fence lizards and other prey species such as skinks, frogs, snakes, and birds and provides opportunities for: (1) 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, birds); (2) short and long distance dispersal within, between, or to adjacent to areas containing essential features (i.e., PCE 1 or PCE 3); and (3) contact with other Alameda whipsnakes for mating and reproduction. (3) Lands containing rock outcrops, talus, and small mammal burrows. These areas are used for retreats (shelter), hibernacula, foraging, dispersal, and provide additional prey population support functions. **70 FR 60608**

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Antioch Dunes evening-primrose	*Oenothera deltoides ssp. howellii*	E	**CCA**	**August 1978**	An area of land, water, and airspace in Contra Costa County with the following components: T. 2 N. R. 2 E. SW\1/4\ section 17, E\2/3\ of S\1/3\ of section 18. **43 FR 39042**
Baker's larkspur	*Delphinium bakeri*	E	**MRN, SON*** * = extirpated	**March 2003** Two units totaling approximately 1,828 acres	(1) Soils that are derived from decomposed shale; (2) Plant communities that support associated species, including, but not limited to: *Umbellularia californica* (California bay), *Aesculus californica* (California buckeye), and *Quercus agrifolia* (coastal live oak), *Baccharis pulularis* ssp. *Consanguinea* (coyotebrush), *Symphorcarpos* cf. *rivularis* (snowberry), *Rubus ursinus* (California blackberry), *Pteridium aqulinum* (braken fern), *Polystichum munitum* (sword fern), *Pityrogramma triangularis* (goldback fern), *Dryopteris arguta* (coastal woodfern), *Adiantum jordanii* (maidenhair fern), *Polypodium glycyrrhiza* (licorice fern), *Toxicodendron diversilobum* (poison oak), *Ceanothus thyrsiflorus* (blueblossom ceanothus), *Lithophragma affine* (woodland star), and *Holodiscus discolor* (oceanspray); (3) Mesic (moderate moisture) conditions on extensive north-facing slopes. **68 FR 12834**
Banded dune (aka Morro shoulderband) snail	*Helminthoglypta walkeriana*	E	**SLO**	**February 2001** Three units totaling approximately 2,566 acres	(1) Sand or sandy soils needed for reproduction; (2) A slope not greater than 10 percent to facilitate movement of individuals; (3) The presence of native coastal dune scrub vegetation. This vegetation is typically, but not exclusively, represented by mock heather, buckwheat, eriastrum, chamisso lupine, dudleya, and in more inland locations, California sagebrush, coyote brush, and black sage. **66 FR 9233**
Bay checkerspot butterfly	*Euphydryas editha bayensis*	T	**SMT, ALA*, CCA*,** SCL * = extirpated	**April 2001** Fifteen units totaling	(1) Stands of *Plantago erecta*, *Castilleja exserta*, or *Castilleja densiflora*; spring flowers providing nectar; pollinators of the bay checkerspot's food and nectar plants;

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				approximately 23,903 acres in San Mateo and Santa Clara counties	(2) Soils derived from serpentinic rock; (3) Space for dispersal between habitable areas. (4) In addition, the following are each primary constituent elements to be conserved when present in combination with one or more of the primary constituent elements above: areas of open grassland, topography with varied slopes and aspects providing surface conditions with warm and moderate to cool temperatures during sunny spring days, stable holes or cracks in the soil and surface rocks or rock outcrops, wetlands providing moisture during times of spring drought. **66 FR 21449**
California condor	*Gymnogyps californianus*	E	**SLO,** KRN, LAX, MNT, SBA, VEN	**September 1977** Nine areas located in seven counties	An area of land, water, and airspace to an elevation of not less than 3,000 feet above the terrain in Sespe-Piru Condor Area in Ventura and Los Angeles Counties; Matlllja Condor Area in Ventura and Santa Barbara Counties; Sisquoc-San Rafael Condor Area in Santa Barbara County; High Mountain--Beartrap Condor Area in San Luis Obispo County; Mt. Pinos Condor Area in Kern and Ventura Counties; Blue Ridge Condor Area in Tulare county; Tejon Ranch in Kern County and Kern and Tulare County Rangelands
California red-legged frog	*Rana aurora draytonii*	T	**ALA**, **BUT, CCA, ELD**, **MEN, MRN, NAP, NEV, PLA, PLU, SCZ, SJQ, SMT, SLO, SOL, SON, TRI, YUB** AMA, CAL, FRE, MER, MNO, MNT, MOD, RIV, SBA, SBD, SBE, SCL,	**April 2006** Thirty-four units totaling approximately 450,288 acres in 19 counties (approximately 287,624 additional acres were designated and then excluded pursuant to Section 4(b)(2) of the Act.	(1) *Aquatic Breeding Habitat.* Standing bodies of fresh water (with salinities less than 7.0 parts per thousand (ppt)), 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; (2) *Non-Breeding Aquatic Habitat.* Fresh water habitats, as described above, that may or 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 that would be 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; (3) *Upland Habitat.* Upland areas within 200 ft (60 m) of the edge of the

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			SFO, STA, TEH, TUO, VEN, LAX		riparian vegetation or dripline surrounding aquatic and riparian habitat and comprised of various vegetational series such as grasslands, woodlands, and/or wetland/riparian plant species that provides 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 can 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; (4) *Dispersal Habitat.* Accessible upland or riparian dispersal habitat within designated units and between occupied locations within 0.7 mi (1.2 km) of each other that allows for movement between such sites. Dispersal habitat includes various natural habitats and altered habitats such as agricultural fields, which do not contain barriers to dispersal. (An example of a barrier to dispersal is a heavily traveled road constructed without bridges or culverts). 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 ac (20 ha) in size, or other areas that do not contain those features identified in PCE 1, 2, or 3 as essential to the conservation of the subspecies. **71 FR 19243**
California tiger salamander	*Ambystoma californiense*	T/E	**AMA, ALA, BUT, COL, CCA, ELD, MRN, NAP, PLA, SAC, SJQ, SLO, SMT, SOL,**	**August 2005** Thirty-one units totaling approximately 199,109 acres in four geographic	(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

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			SUT YOL, YUB, SCZ, SON,** SBA**, MNT, SBE,	regions: (1) The Central Valley Region; (2) the Southern San Joaquin Valley Region; (3) the East Bay Region (including Santa Clara Valley area); and (4) the Central Coast Region.	predation; (3) Accessible upland dispersal habitat between occupied locations that allow for movement between such sites. **70 FR 49379** **Approximately 17,418 acres of critical habitat for the Sonoma County Distinct Population Segment was designated and excluded based on the development of a conservation strategies and also as a result of economic exclusions authorized under section 4(b)(2) of the Act. **70 FR 74137**
Camatta canyon amole	*Chlorogalum purpureum var. reductum*	T	**SLO, MNT**	**October 2002** Totaling approximately 5,910 acres in two counties	(1) Well-drained, red clay soils with a large component of gravel and pebbles on the upper soil surface; (2) Plant communities in functioning ecosystems that support associated plant and animal species (*e.g.*, pollinators, predator-prey species, etc.), including grassland, blue oak woodland or oak savannahs, oak woodland, and open areas within shrubland communities. Within these vegetation communities *C. p.* var. *reductum* appears where there is little cover of other species which compete for resources available for growth and reproduction. **67 FR 65414**
Contra Costa wallflower	*Erysimum capitatum ssp. angustatum*	E	**CCA**	**August 1978**	An area of land, water, and airspace in Contra Costa County, with the following components: T. 2 N. R. 2 E. SW\1/4\ section 17, E\2/3\ of S\1/3\ of section 18. **43 FR 39042**
delta green ground beetle	*Elaphrus viridis*	T	**SOL**	**August 1980**	Solano County, California T.5N., R.1E., W\1/2\section 12, SW\1/4\section 13, SE\1/4\section 14, NE\1/4\section 23, NW\1/4\section 24. **45 FR 52807**
delta smelt	*Hypomesus transpacificus*	T	**CCA, NAP, SAC, SJQ, SOL, YOL**	**December 1994**	(1) Physical habitat, water, river flow, and salinity concentrations required to maintain delta smelt habitat for spawning, larval and juvenile transport, rearing, and adult migration; (2) All geographic areas of all water and all submerged lands below ordinary

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					high water and the entire watercolumn bounded by and contained in Suisun Bay (including the contiguous Grizzly and Honker Bays); the length of Goodyear. Suisun, Cutoff, First Mallard (Spring Branch), and Montezuma sloughs; and the existing contiguous waters contained within the Delta, as defined in section 12220 of the California Water Code. **67 FR 65256**
Fresno kangaroo rat	*Dipodomys nitratoides exilis*	E	**MAD*, MER*,** FRE*, KNG * = extirpated	**January 1985** Includes 857 acres in Fresno County. Twenty-three acres are in a small part of the Mendota Wildlife Management Area, 732 acres comprise the contiguous Alkali Sink ER, and 102 acres are in five privately-owned parcels.	(1) **50 FR 4222—Not available on the Internet and unable to locate at the Sacramento Field Office.**
Kneeland Prairie penny-cress	*Thlaspi californicum*	E	**HUM**	**October 2002** One unit totaling approximately 74 acres in Humboldt County	(2) Thin rocky soils that have developed on exposures of serpentine substrates; (3) Plant communities that support a relatively sparse assemblage of serpentine indicator or facultative-serpentine indicator species, including various native forbs and grasses but not trees or shrubs, such that competition for space and water (both above and below ground), and light is reduced, compared to the surrounding habitats. Known associated species include: *Festuca rubra* (red fescue), *Koeleria macrantha* (junegrass), *Elymus glaucus* (blue wildrye), *Eriophyllum lanatum* (woolly sunflower), *Lomatium macrocarpum* (large-fruited lomatium), and *Viola hallii* (Hall's violet); (4) Serpentine substrates that contain 15 percent or greater (by surface area) of exposed gravels, cobbles, or larger rock fragments, which may contribute to

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					alteration of factors of microclimate, including surface drainage and moisture availability, exposure to wind and sun, and temperature; (5) Prairie grasslands and oak woodlands located within 30 m (100 ft) of the serpentine outcrop area on Ashfield Ridge. Protection of these habitats is essential to the conservation of the *Thlaspi californicum* in that it will provide connectivity among the serpentine sites, help to maintain the hydrologic and edaphic integrity of the serpentine sites, and support populations of pollinators and seed dispersal organisms. **67 FR 62897**
LaGraciosa thistle	*Cirsium loncholepis*	E	**SLO,** SBA	**March 2004** Two units totaling approximately 41,089 acres in two counties	(1) Moist, sandy soils associated with dune swales, margins of dune lakes and marshes, seeps, intermittent streams, and river margins from the Guadalupe Dune complex along the coast and inland to Can˜ ada de las Flores; (2) Plant communities that support associated wetland species, including: *Juncus* spp. (rush), *Scirpus* spp. (tule), and *Salix* spp. (willow); (3) Hydrologic processes, particularly the maintenance of a stable groundwater table supporting the soil moisture regime that appears to be favored by *Cirsium loncholepis*. **69 FR 12553**
large-flowered fiddleneck	*Amsinckia grandiflora*	E	**ALA, SJQ, CCA**	**May 1985**	(1) San Joaquin County (Mount Diablo Meridian) T3S R4E Section 28 W\1/2\ NW\1/4\ and W\1/2\ SW\1/4\ (2) Steep, west- and south-facing slope with light textured but stable soils. **50 FR 19374**
Least Bell's vireo	*Vireo bellii pusillus*	E	**SJQ, SCZ, SLO,** INY, KRN, LA, SBA, SBD, SBE, VEN, RVR, SDG	**February 1994** Ten localities totaling approximately 36,000 acres in portions of six counties **in southern California only**	Riparian woodland vegetation that generally contains both canopy and shrub layers, and includes some associated upland habitats. Vireos meet their survival and reproductive needs (food, cover, nest sites, nestling and fledgling protection) within the riparian zone in most areas. In some areas they also forage in adjacent upland habitats. **59 FR 4845**
Lost river sucker	*Deltistes luxatus*	E	**SIS,** MOD	**Proposed December 1994**	(1) A sufficient quantity of water of suitable quality (i.e., temperature, dissolved oxygen, flow rate, pH, nutrients, lack of contaminants, turbidity,

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				Approximately 424,000 acres of stream, river, lake, and shoreline areas.	etc.) to provide conditions required for the particular life stage for each species; (2) A physical habitat including areas of the Upper Klamath Basin watershed that are inhabited or potentially habitable by suckers for use as refugia from stressful water quality conditions or predation, or for use as in spawning, nursery, feeding, or rearing areas, or as corridors between these areas; (3) A food supply and a natural scheme of predation, parasitism, and competition in the biological environment. Food supply is a function of nutrient supply, productivity, and availability for each life stage of the species. Predation, although considered a normal component of this environment, may be out of balance due to introduced fish species or the elimination of refugial structures such as cover and shelter. Competition from nonnative fish species and parasitism may also be elevated due to stresses induced by degraded habitats. **59 FR 61744**
Marbled murrelet	*Brachyramphus marmoratus*	T	**DEL, HUM, SIS, TRI, MEN, SON, MRN, SMT, SCZ**	**May 1996** 32 units totaling approximately 3.9 million acres In California, 14 units totaling approximately 741,000 acres	(1) individual trees with potential nesting platforms; and (2) forested areas within 0.8 kilometers (0.5 miles) of individual trees with potential nesting platforms, and with a canopy height of at least one-half the site-potential tree height. This includes all such forest, regardless of contiguity. **61 FR 26256**
Monterey spineflower	*Chorizanthe pungens* var. *pungens*	T	**SCZ, SLO**,** MNT * = extirpated	**May 2002** Ten units totaling approximately 18,830 acres in two counties	(1) Sandy soils associated with active coastal dunes, coastal bluffs with a deposition of windblown sand, inland sites with sandy soils, and interior floodplain dunes; (2) Plant communities that support associated species, including coastal dune, coastal scrub, grassland, maritime chaparral, oak woodland, and interior floodplain dune communities, and have a structure with openings between the dominant elements (e.g., scrub, shrub, oak trees, clumps of herbaceous

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					vegetation); (3) No or little cover by non-native species which compete for resources available for growth and reproduction of *Chorizanthe pungens* var. *pungens*; (4) Physical processes, such as occasional soil disturbance, which support natural dune dynamics along coastal areas. **67 FR 37497**
Morro Bay kangaroo rat	*Dipodomys heermanni morroensis*	E	**SLO**	**August 1977**	An area of land, water, and airspace in san Luis Obispo County with the following components (Mt. Diablo Meridian) T30S, RlOE S ½ , Sec. 14 those portions of Sec. 23-24 west of Pecho Valley Road. **77 FR 40685**
northern spotted owl	*Strix occidentalis caurina*	T	**COL, DEL, HUM, MEN, SIS, TRN, SHA, LAK,** TEH, GLE	**January 1992** 190 areas, encompassing a total of nearly 6.9 million acres. Only 61 units totaling 1.4 million acres are in California.	Forested lands that are used or potentially used by the northern spotted owl for nesting, roosting, foraging, or dispersal. **57 FR 1796**
Oregon silverspot butterfly	*Speyeria zerene hippolyta*	T	**No units designated in California**	One unit in Lane County, Oregon	The larval foodplant (*Viola adunca*), grasses, and forbs in which the larvae find shelter, the composite plants from which the adults obtain nectar, and the spruce woods in which the adults find shelter. **45 FR 44935**
Purple amole	*Chlorogalum purpureum var. purpureum*	T	**SLO,** MNT	**October 2002** Totaling approximately 5,910 acres in two counties	(1) Well-drained, red clay soils with a large component of gravel and pebbles on the upper soil surface; (2) Plant communities in functioning ecosystems that support associated plant and animal species (*e.g.*, pollinators, predator-prey species, etc.), including grassland, blue oak woodland or oak savannahs, oak woodland, and open areas within shrubland communities. Within these vegetation communities *C. p.* var. *reductum* appears where there is little cover of other species

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					which compete for resources available for growth and reproduction. **67 FR 65414**
robust spineflower	*Chorizanthe robusta*	E	**SCZ, ALA*, SMT*,** MNT, SCL * = extirpated	**May 2002** Six units totaling approximately 469 acres in one county	(1) Sandy soils associated with active coastal dunes and inland sites with sandy soils; (2) Plant communities that support associated species, including coastal dune, coastal scrub, grassland, maritime chaparral, and oak woodland communities, and have a structure such that there are openings between the dominant elements (*e.g.* scrub, shrub, oak trees, clumps of herbaceous vegetation); (3) Plant communities that contain little or no cover by nonnative species which would complete for resources available for growth and reproduction of *Chorizanthe robusta* var. *robusta;* (4) Physical processes, such as occasional soil disturbance, which support natural dune dynamics along coastal areas. **67 FR 36829**
Santa Cruz tarplant	*Holocarpha macradenia*	T	**SCZ, ALA*, CCA*, MRN*,** MNT * = extirpated	**October 2002** Eleven units totaling approximately 2,902 acres in three counties	(1) Soils associated with coastal terrace prairies, including the Watsonville, Tierra, Elkhorn, Santa Inez, and Pinto series; (2) Plant communities that support associated species, including native grasses such as *Nassella* sp. (needlegrass) and *Danthonia californica* (California oatgrass); native herbaceous species such as members of the genus *Hemizonia* (other tarplants), *Perideridia* gairdneri (Gairdner's yampah), *Plagiobothrys diffusus* (San Francisco popcorn flower), and *Trifolium buckwestiorum* (Santa Cruz clover); (3) Physical processes, particularly soils and hydrologic processes, that maintain the soil structure and hydrology that produce the seasonally saturated soils characteristic of *Holocarpha macradenia* habitat. **67 FR 63967**

Appendix E

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Scott's Valley polygonum	*Polygonum hickmanii*	E	**SCZ**	**April 2003** Two units totaling approximately 287 acres in one county	(1) Thin soils in the Bonnydoon series that have developed over outcrops of Santa Cruz mudstone and Purisima sandstone; (2) ''Wildflower field'' habitat that has developed on these thin-soiled sites; (3) A grassland plant community that supports the ''wildflower field'' habitat and that supports the pollinator activity and seed dispersal mechanisms that typically occur within the grassland plant community; (4) Areas around each colony to allow for recolonization to adjacent suitable microhabitat sites; (5) Habitat within the subwatersheds upslope to the ridgelines to maintain the edaphic and hydrologic conditions and slope stability that provide the seasonally wet substrate for growth and reproduction of *P. hickmanii*. **68 FR 16970**
Scott's Valley spineflower	*Chorizanthe robusta* var. *hartwegii*	E	**SCZ**	**May 2002** Two units totaling approximately 287 acres in one county	(1) Thin soils in the Bonnydoon series that have developed over outcrops of Santa Cruz mudstone and Purisima sandstone; (2) ''Wildflower field'' habitat that has developed on these thin-soiled sites; (3) A grassland plant community that supports the ''wildflower field'' habitat, that is stable over time and in which nonnative species are absent or are at a density that has little or no adverse effect on resources available for growth and reproduction of *Chorizanthe robusta* var. *hartwegii*; (4) Sufficient areas around each population to allow for recolonization to adjacent suitable microhabitat sites in the event of catastrophic events; (5) Pollinator activity between existing colonies of *Chorizanthe robusta* var. *hartwegii;* (6) Seed dispersal mechanisms between existing colonies and other potentially suitable sites;

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					(7) Sufficient integrity of the watershed above habitat for *Chorizanthe robusta* var. *hartwegii* to maintain soil and hydrologic conditions which provide the seasonally wet substrate for growth and reproduction of *C. r.* var. *hartwegii*. **67 FR 37336**
Shortnose sucker	*Chasmistes brevirostris*	E	**SIS,** MOD	**Proposed December 1994** Approximately 456,000 acres of stream, river, lake, and shoreline areas.	(1) A sufficient quantity of water of suitable quality (i.e., temperature, dissolved oxygen, flow rate, pH, nutrients, lack of contaminants, turbidity, etc.) to provide conditions required for the particular life stage for each species; (2) A physical habitat including areas of the Upper Klamath Basin watershed that are inhabited or potentially habitable by suckers for use as refugia from stressful water quality conditions or predation, or for use as in spawning, nursery, feeding, or rearing areas, or as corridors between these areas; (3) A food supply and a natural scheme of predation, parasitism, and competition in the biological environment. Food supply is a function of nutrient supply, productivity, and availability for each life stage of the species. Predation, although considered a normal component of this environment, may be out of balance due to introduced fish species or the elimination of refugial structures such as cover and shelter. Competition from nonnative fish species and parasitism may also be elevated due to stresses induced by degraded habitats. **59 FR 61744**
soft bird's-beak	*Cordylanthus mollis ssp. mollis*	E	**SOL, NAP, CCA, MRN*, SON*, SAC*** * = extirpated	**Proposed April 2006** Five units totaling approximately 2,313 acres in three counties. One additional unit totaling approximately 402 acres (Concord Naval Weapons	(1) Tidally influenced marsh areas (intertidal emergent estuarine marshes) bounded on the seaward edge by the mean high water line and on the landward edge by a marsh-upland ecotone; and containing channel networks influenced by freshwater and saltwater hydrology and exhibiting full natural tidal inundations to allow for channel development and migration through erosional and depositional processes (such as channel undercutting, bank slumping, and sedimentation) during daily flood and ebb flows and seasonal storm events; (2) Areas associated with PCE 1 that are within tidally influenced marsh floodplains that contain hydric soils that are slightly to moderately saline (4 to 16 dS/m) within the first 3 ft (0.9 m) of soil depth;

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				Station, Middle Point Marsh and western portion of Hastings Marsh) was proposed and excluded.	(3) Tidal marsh habitats within PCE 1 and PCE 2 that have native halophytic plant communities with an average canopy height equal to or less than 20.5 in (52 cm); (4) Areas within PCE 1 and PCE 2 that provide for a sufficient number of suitable host plants, including but not limited to *Distichlis spicata, Salicornia virginica*, and *Jaumea carnosa*. These host plants provide the subspecies with water and nutritional requirements to augment its growth. **71 FR 18455**
Suisun thistle	*Cirsium hydrophilum var. hydrophilum*	E	**SOL**	**Proposed April 2006** Three units totaling approximately 2,119 acres in one county	(1) Tidally influenced marsh areas (intertidal emergent estuarine marshes) bounded on the seaward edge by the mean high water line and on the landward edge by a marsh-upland ecotone; and containing channel networks influenced by freshwater and saltwater hydrology and exhibiting full natural tidal inundations to allow for channel development and migration through erosional and depositional processes (such as channel undercutting, bank slumping, and sedimentation) during daily flood and ebb flows and seasonal storm events; (2) Areas associated with PCE 1 that are: (a) Between the bank and high water mark of natural tidal channels; (b) along the banks of tidally influenced canals or ditches; or (c) within tidally influenced floodplains that contain hydric soils that are slightly to moderately saline (4 to 16 decisiemens/ meter (dS/m)) within the first 3 ft (0.9 m) of soil depth. **71 FR 18455**
tidewater goby	*Eucyclogobius newberryi*	E	**DEL, HUM, MEN, SON, MRN, SMT, SCZ, SLO, ALA, CCA, NAP,** LAX, MNT, VEN, SBA, ORG, SCL, SDG,	**November 2000** 10 coastal stream segments in Orange and San Diego Counties, California, totaling approximately 9 linear miles of	(1) Coastal lagoons and estuaries supported by a relatively natural hydrologic regime and an environment with so few exotic fishes that tidewater gobies are unaffected by their presence; (2) A system that is free from exotic species or nearly so. **65 FR 69693**

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			SFO	stream channels and their associated wetlands, flood plains, and estuaries.	
valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	T	**AMA, BUT, COL, ELD, CCA, LAK, NAP, NEV, PLA, SAC, SJQ, SOL, SUT, YOL, YUB,** CAL, FRE, GLE, KNG, KRN, MAD, MER, MAR, SHA, STA, TEH, TUL, TUO	**August 1980**	(1) An area in the city of Sacramento enclosed on the north by the Route 160 Freeway, on the west and southwest by the Western Pacific railroad tracks, and op the east by Commerce Circle and its extension southward tqthe railroad tracks; (2) American River Parkway Zone. An area of the American River Parkway on the south bank of the American River, bounded on the north by latitude 30”37’30”N, on the west and southwest by Elmanto Drive from its junction with Ambassador Drive to its extension to Jatitute 38”37’30”N, and on the south and east by Ambassador Drive and its extension north to latitude 38’37’30”N. Goethe Park, and that portion of the American River Parkway northeast of Goethe Park, west of the Jedediah Smith Memorial Bicycle Trail, and north to a line extended eastward from Palm Drive. **45 FR 52803**
Warner sucker	*Catostomus warnerensis*	T	**SIS**	**September 1985**	(1) Riparian vegetation to prevent siltation and run-off of other pollutants; (2) Shading from small trees and shrubs in the riparian zone to maintain suitable water temperature and dissolved oxygen levels in the streams; (3) Stream areas that include spawing and rearing habitat. (4) Includes the following streams and lakes in Lake County, Oregon, and 50 feet on either side of the stream banks: 4 stream miles of Twelvemile Creek, 16 stream miles of Twentymile Creek, 2 stream miles of the spillway canal north of Hart Lake, 3 stream miles of Snyder Creek, and 16 stream miles of Honey Creek. The SO-foot riparian zone on each side of the streams is included to protect the integrity of the stream ecosystem. **50 FR 39117**

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western snowy plover	*Charadrius alexandrinus nivosus*	T	**Coastal California, SF Bay** **ALA, DEL, MEN, HUM, MRN, NAP, SMT, SOL, SON, SCZ, SLO, YOL,** LAX, MNT, SBA, ORG, RIV, SBD, SCL, SDG, SFO, VEN	**September 2005** 32 units totaling approximately 12,145 acres in three states (WA, OR, CA). In California, 24 units in CA totaling 7,477 acres.	(1) Sparsely vegetated areas above daily high tides (such as sandy beaches, dune systems immediately inland of an active beach face, salt flats, seasonally exposed gravel bars, dredge spoil sites, artificial salt ponds and adjoining levees) that are relatively undisturbed by the presence of humans, pets, vehicles or human-attracted predators; (2) Sparsely vegetated sandy beach, mud flats, gravel bars or artificial salt ponds subject to daily tidal inundation but not currently under water, that support small invertebrates such as crabs, worms, flies, beetles, sand hoppers, clams, and ostracods; (3) Surf or tide-cast organic debris such as seaweed or driftwood located on open substrates such as those mentioned above (essential to support small invertebrates for food, and to provide shelter from predators and weather for reproduction). **70 FR 56970**
yellow larkspur	*Delphinium luteum*	E	**SON, MRN*** * = extirpated	**March 2003** Four units totaling approximately 2,525 acres	(1) Soils that are derived from decomposed shale; (2) Plant communities that support associated species, including, but not limited to: *Umbellularia californica* (California bay), *Aesculus californica* (California buckeye), and *Quercus agrifolia* (coastal live oak), *Baccharis pulularis* ssp. *Consanguinea* (coyotebrush), *Symphorcarpos* cf. *rivularis* (snowberry), *Rubus ursinus* (California blackberry), *Pteridium aqulinum* (braken fern), *Polystichum munitum* (sword fern), *Pityrogramma triangularis* (goldback fern), *Dryopteris arguta* (coastal woodfern), *Adiantum jordanii* (maidenhair fern), *Polypodium glycyrrhiza* (licorice fern), *Toxicodendron diversilobum* (poison oak), *Ceanothus thyrsiflorus* (blueblossom ceanothus), *Lithophragma affine* (woodland star), and *Holodiscus discolor* (oceanspray); (3) Mesic (moderate moisture) conditions on extensive north-facing slopes. **68 FR 12834**

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Zayante band-winged grasshopper	*Trimerotropis infantilis*	E	**SCZ**	**February 2001** One unit toataling approximately 10,560 acres in one county.	(1) The presence of Zayante soils; (2) The occurrence of Zayante sand hills habitat and the associated plant species; (3) Certain microhabitat conditions, including areas that receive large amounts of sunlight, widely scattered tree and shrub cover, bare or sparsely vegetated ground, and loose sand. **66 FR 9219**

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VERNAL POOL SPECIES

conservancy fairy shrimp	*Branchinecta conservatio*	E	**BUT, SOL,** COL, MAR?, MER, STA?, TEH, VEN	**February 2006** Eight units totaling approximately 161,786 acres in eight counties	(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 described below in paragraph (2)(ii), 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 18 to 41 days (depending on the specific species present in each pool), 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 (iv) Structure within the pools described above in paragraph (2)(ii), 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. **71 FR 7117**
longhorn fairy shrimp	*Branchinecta longiantenna*	E	**SLO, CCA, ALA,** MER	**February 2006** Three units totaling approximately 13,557 acres in four counties	
vernal pool fairy shrimp	*Branchinecta lynchi*	T	**AMA, BUT, COL, NAP, PLA, SAC, ALA, SJQ, SLO, SOL, SUT, YOL, YUB,** FRE, KNG, MAD, MAR, MER, MNT, SBE, SBA, SHA, STA, TEH, TUL, VEN, TUO, SCL, KRN, GLE, CAL,	**February 2006** Thirty-two units totaling approximately 597,821 acres in 24 counties	

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vernal pool tadpole shrimp	*Lepidurus packardi*	E	**ALA, AMA, BUT, COL, CCA, PLA, SAC, SJQ, SOL, SUT, YOL, YUB,** SBE, FRE, KNG, MAD, MER, STA, TEH, TUL, CAL, ELD, GLE, SHA,	**February 2006** Eighteen units totaling approximately 228,785 acres in 17 counties	(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 described below in paragraph (2)(ii), 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 18 to 41 days (depending on the specific species present in each pool), 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 (iv) Structure within the pools described above in paragraph (2)(ii), 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. **71 FR 7117**

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Butte County (Shippee) meadowfoam	*Limnanthes floccosa ssp. californica*	E	**BUT,** TEH	Four units totaling approximately 16, 636 acres in two counties	(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 described in paragraph (2)(ii) of this section, 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 or whose soils are saturated for a period long enough to promote germination, flowering, and seed production of predominantly annual native wetland species and 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. **71 FR 7117**
Colusa grass	*Neostapfia colusana*	T	**COL*, SOL, YOL,** MAR, MER, STA, TUO * = extirpated	Seven units totaling approximately 152,093 acres in five counties	
Contra Costa goldfields	*Lasthenia conjugens*	E	**ALA, CCA, MEN*, NAP, SOL,** MNT, SBA*, SCL* * = extirpated	Nine units totaling approximately 14,730 acres in five counties	
fleshy owl's-clover	*Castilleja campestris ssp. succulenta*	T	**SJQ,** FRE, MAD, MAR, MER, TUO, STA	Six units totaling approximately 175,873 acres in seven counties	
Greene's tuctoria	*Tuctoria greenei*	E	**BUT, SJQ*,** MAD*, MER, MAR?, SHA, STA*, TEH, TUO?, FRE*, GLE, TUL* * = extirpated	Eight units totaling approximately 145,118 acres in eight counties	

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hairy Orcutt grass	*Orcuttia pilosa*	E	**BUT,** GLE, MAD, MER, STA, TEH, FRE?, MAR?	Six units totaling approximately 79,608 acres in seven counties	(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 described in paragraph (2)(ii) of this section, 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 or whose soils are saturated for a period long enough to promote germination, flowering, and seed production of predominantly annual native wetland species and 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. **71 FR 7117**
Hoover's spurge	*Chamaesyce hooveri*	T	**BUT,** GLE, TEH, MER, STA, TUL, TUO?	Six units totaling approximately 114,713 acres in five counties	
Sacramento Orcutt grass	*Orcuttia viscida*	E	**SAC**	Three units totaling approximately 33,273 acres in two counties	
San Jooaquin Valley Orcutt grass	*Orcuttia inaequalis*	T	**MAD, MER, STA, SUT*, TUL, SOL,** FRE * = extirpated	Six units totaling approximately 136, 312 acres in five counties	
slender Orcutt grass	*Orcuttia tenuis*	T	**LAK, LAS, PLU, SIS, SAC,** MOD, TEH	Six units totaling approximately 94,213 acres in eight counties	
Solano grass	*Tuctoria mucronata*	E	**SOL, YOL**	Two units totaling approximately 440 acres in one county	

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COUNTY ABBREVIATIONS USED IN APPENDIX E

Alameda	**ALA**	Inyo	**INY**	Napa	**NAP**	San Luis	**SLO**	Trinity	**TRI**
Alpine	**ALP**	Kern	**KRN**	Nevada	**NEV**	San Mateo	**SMT**	Tulare	**TUL**
Amador	**AMA**	Lake	**LAK**	Kings	**KNG**	Santa Barbara	**SBA**	Tuolumne	**TUO**
Butte	**BUT**	Lassen	**LAS**	Orange	**ORG**	Santa Clara	**SCL**	Ventura	**VEN**
Calaveras	**CAL**	Los Angeles	**LAX**	Placer	**PLA**	Santa Cruz	**SCZ**	Yolo	**YOL**
Colusa	**COL**	Madera	**MAD**	Plumas	**PLU**	Shasta	**SHA**	Yuba	**YUB**
Contra Costa	**CCA**	Marin	**MRN**	Riverside	**RIV**	Sierra	**SIE**		
Del Norte	**DEL**	Mariposa	**MAR**	Sacramento	**SAC**	Siskiyou	**SIS**		
El Dorado	**ELD**	Mendocino	**MEN**	San Benito	**SBE**	Solano	**SOL**		
Fresno	**FRE**	Merced	**MER**	San Bernadino	**SBD**	Sonoma	**SON**		
Glenn	**GLE**	Modoc	**MOD**	San Diego	**SDG**	Stanislaus	**STA**		
Humboldt	**HUM**	Mono	**MNO**	San Francisco	**SFO**	Sutter	**SUT**		
Imperial	**IMP**	Monterey	**MNT**	San Joaquin	**SJO**	Tehama	**TEH**		

ATTACHMENT 1

January 12, 2000, Agreement Regarding Section 7 Consultation on the Endangered Species Act when U.S. Army Corps of Engineers serves as Lead Agency for FEMA-Funded Actions

[PLACEHOLDER]