United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In Reply Refer To:
08ESMF00-2012-F-0524

SEP 26 2012

Barbara Eggers
Acting Assistant State Conservationist for Field Operations
Natural Resource Conservation District
Salinas Area Office
318 Cayuga Street, Suite 206
Salinas, California 93901-2668

Subject: Programmatic Formal Consultation on the Natural Resources Conservation Service's Conservation Practices in Alameda County, California

Dear Ms. Eggers:

This is in response to the Natural Resources Conservation Service's (NRCS) July 27, 2012, letter requesting formal consultation with the U.S. Fish and Wildlife Service (Service) on the NRCS's Proposed Conservation Practices in Alameda County, California. The Service received your request via electronic mail on July 28, 2012. You requested concurrence that the proposed project was likely to adversely affect the Callippe silverspot butterfly (*Speyeria callippe callippe*), California red-legged frog (*Rana draytonii*) and its designated critical habitat, Central California Distinct Population Segment (DPS) of the California tiger salamander (*Ambystoma californiense*) (Central California tiger salamander) and its critical habitat, Alameda whipsnake (*Masticophis lateralis euryxanthus*) and its critical habitat, and San Joaquin kit fox (*Vulpes macrotis mutica*). The Service concurs with your determination, and this biological opinion addresses the effects of the project on these five listed species and associated critical habitat. The NRCS actions would control erosion, reduce sedimentation, restore native vegetation, restore pond habitat, and improve riparian vegetation and upland habitat. This document is issued pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. §1531 et seq.) (Act).

The findings and recommendations in this formal consultation are based on: (1) multiple electronic mail correspondences between NRCS and the Service from January to July 2012; (2) your June 27, 2012, initiation letter and accompanying *Biological Assessment for Natural Resource Conservation Service's Proposed Conservation Practices in Alameda County* (Biological Assessment); and (3) additional information available to the Service.

Consultation History

December 19, 2011: A site visit to Alameda County was conducted by Jackie Charbonneau (NRCS) and Kim Squires and Rick Kuyper (Service). The purpose of the site visit was to familiarize Service staff with conservation practices being implemented by NRCS on a representative private landowner's property.

January 2012 – July 2012: Jackie Charbonneau, Kim Squires, and Rick Kuyper sent multiple electronic mail correspondences to discuss the proposed project. The Service provided technical assistance in the preparation of the Biological Assessment.

July 28, 2012: NRCS requested initiation of formal section 7 consultation for the proposed project.

BIOLOGICAL OPINION

Introduction

The NRCS provides technical and financial assistance to private land owners and managers in the conservation, maintenance, and improvement of their soil, water, animals, plants, and air resources. Their mission of "Helping People Help the Land" encourages partnership efforts and strives to enable people to be good stewards of the nation's natural resources. The purpose of this Programmatic Biological Opinion is to expedite the formal section 7 consultation process for projects funded and implemented by the NRCS. The geographic scope of this consultation is within Alameda County. This biological opinion is intentionally broad in scope and attempts to analyze the potential adverse effects to federally-listed species resulting from all anticipated NRCS activities within Alameda County. This Programmatic Biological Opinion is consistent with the Eastern Alameda County Conservation Strategy, in which NRCS participated in its development.

Project Description

The NRCS is involved in many collaborative partnerships with private and public landowners and land managers, other government agencies, and non-governmental organizations to achieve conservation of natural resources within Alameda County. The NRCS works with land managers to develop a plan that is designed to benefit the soil, water, air, plants, and animals on their property. The land manager can then apply for financial assistance to implement the plan through a variety of NRCS programs. NRCS funding occurs on a somewhat regular interval through the Farm Bill. These Farm Bill programs, such as the Environmental Quality Incentives Program (EQIP), Wildlife Habitat Incentive Program (WHIP), and Conservation Stewardship Program (CSP), are used to implement conservation practices that result in habitat improvements, vegetation management, erosion and/or drainage control, and water quality and conservation.

In some cases the NRCS works with the land manager to use funding specifically to implement projects that will benefit federally-listed species. In other circumstances, the conservation practices are not designed to benefit a federally-listed species but may provide incidental benefits to federally-listed species. Other projects implemented by the NRCS will be neutral, with neither a positive or negative effect on federally-listed species, but do always have a benefit to natural resources. If the NRCS determines that a project will result in long-term negative effects to federally-listed species they will not fund the project. Programs under the new 2012 Farm Bill may have changed names and eligibility requirements, but will still address the resource concerns listed above. A summary of some of the main NRCS programs that are currently utilized in Alameda County follows.

Environmental Quality Incentives Program

The EQIP is a voluntary program that provides financial and technical assistance to agricultural producers through contracts up to a maximum term of ten years in length. These contracts provide financial assistance to help plan and implement conservation practices that address natural resource concerns and for opportunities to improve soil, water, plant, animal, air and related resources on agricultural land and non-industrial private forestland. In addition, a purpose of EQIP is to help producers meet Federal, State, Tribal and local environmental regulations.

Wildlife Habitat Incentives Program

The WHIP is a voluntary program for private and Tribal land to develop or improve high quality habitat that supports fish and wildlife populations of National, State, Tribal, and local significance. Through WHIP, NRCS provides technical and financial assistance to land managers and others to develop upland, wetland, aquatic, and other types of wildlife habitat on their property. Each NRCS state office may identify priorities for enrollment in WHIP that complement the goals and objectives of relevant fish and wildlife conservation initiatives at the State, regional, and national levels. The priorities serve as a guide for the development of WHIP ranking criteria in a state.

Conservation Stewardship Program

The CSP is a voluntary program that encourages agricultural and forestry producers to address resource concerns by: (1) undertaking additional conservation activities; and (2) improving and maintaining existing conservation systems. CSP provides financial and technical assistance to help land stewards conserve and enhance soil, water, air, and related natural resources on their land.

Implementation Procedure

This consultation covers only NRCS activities in Alameda County. The following process will be used when reviewing proposed projects for inclusion of this consultation.

1. The NRCS will submit a letter to the Service, requesting that a project be appended to this

programmatic consultation. The letter will include a location map, project plan map, and project description, and a statement why the project is appropriate to be appended to the Programmatic Biological Opinion (e.g., it meets the requirements specified in this biological opinion).

2. The Service will review the proposed project to determine if it is appropriate to append the proposed project to this Programmatic Biological Opinion or if the proposed project should undergo a separate section 7 consultation. In addition, the Service will inform NRCS if the information is complete to begin consultation.

3. Within 30 working days, the Service will respond with a letter appending the proposed project to this programmatic consultation or will request that the proposed project undergo a separate consultation and provide the reasoning why.

4. If the Service cannot meet the 30-day limit due to workload or other constraints the Service will inform NRCS.

Covered Activities

A description of conservation actions implemented by the NRCS follows. These descriptions are not Farm Bill program specific as many of these practices could occur under a variety of NRCS programs.

Pond Restoration: Pond restoration activities would involve the repair, maintenance and restoration of livestock ponds. Projects would be aimed at improving wildlife breeding habitat, decreasing predatory species populations in suitable habitat, reducing soil erosion and sedimentation, and/or improving livestock and wildlife water availability. Pond restoration activities include one or more of the following activities:

- Control predator species - Drain ponds to remove predators such as bullfrogs and non-native fish species such as bass, catfish, sunfish, and mosquito fish.

- Pond de-siltation – Removal of sediment from existing ponds to increase and improve available breeding habitat. Desiltation of livestock ponds shall not involve any increase in the original storage capacity of a pond and shall incorporate design features that will benefit listed species.

- Establish native vegetation - Plant native vegetation around ponds and control non-native invasive plant species.

- Structural components repair - Improve and repair spillways, provide alternative pipe outlets for water flow, and repair embankments as deemed necessary. This activity can be used to improve the size of a spillway to adequately address the hydrology of the

watershed and/or repair a spillway that is actively eroding and contributing sediment downstream.

- Obstruction removal - The removal of concrete rubble, rip-rap, rock, wood, old tires, refuse (such as household trash) and other debris from the pond area and spillway.

Stream Restoration: Stream restoration activities would involve the repair, maintenance and restoration of aquatic and riparian corridor habitat. These activities are designed to provide erosion control measures, reduce sedimentation, improve water quality and restore and improve the overall quality of riparian habitat. Stream restoration activities include one or more of the following activities:

- Native Riparian Habitat Restoration - Planting, maintenance and establishment of native vegetation along riparian corridors to enhance and improve habitat. Invasive and non-native plant removal in riparian areas, including but not limited to *Arundo donax*, Himilayan blackberry, English ivy and other non-native, invasive plant species. Removal of non-native plant species will occur by hand, herbicide application, and/or mechanical means.

- In-Stream Structures - Installation of suitable structures to stabilize stream channels that are undergoing damaging aggradation (filling in of) or degradation that cannot be controlled by upstream practices. Installation of suitable structures to stabilize and protect streambanks from erosion. This activity could include installation of rock, concrete, vegetative or large woody structures. This activity may also include the removal of accumulated sand or sediment.

- Obstruction removal - The removal of concrete rubble, rip-rap, rock, wood, cars, old tires, refuse (such as household trash) and other debris from the stream.

Livestock and Wildlife Water Distribution: Livestock and Wildlife Water Distribution activities would involve the installation of off stream water developments for cattle and wildlife. These off-stream water developments may help reduce pressure on riparian habitats and other aquatic features by decreasing the amount of time livestock spend in streams, enhancing water quality and reducing sedimentation from streambank erosion. Proper placement of off stream developments can also contribute to proper forage use by livestock which may decrease erosion and presence of weeds and invasive plants, resulting in improvements to the surrounding upland habitat. In addition to providing additional livestock water to support ongoing grazing management, these facilities also provide clean and readily available water for wildlife such as bats, birds, deer and other mammals. Livestock and water distribution activities include one or more of the following activities:

- Spring Development - Installation of a spring box or slotted collector pipe to collect water at a seep or spring. Installation includes materials such as sand and/or gravel and non-woven geotextile fabric filter to prevent sediment from entering the system. Sufficient spring flow will remain in the wetland area to maintain wetland functions and values. Overflow from the development will be directed back into the wetland area. All spring developments will be designed to have a no net loss of wetlands.

- Off-stream Water Facilities - Installation of watering facilities, including tanks and/or troughs. This activity includes a gravel or concrete pad under each watering facility. This activity can be associated with spring developments, wells, or other off-stream water sources. All troughs will have float valves installed to control water flow. All troughs will have escape ramps for wildlife.

- Pipeline - Installation of underground and/or above ground pipelines for conveying water from water sources (springs, wells) to alternative locations. This practice is used in conjunction with other livestock and wildlife water improvement activities. Pipeline will be designed to follow existing impacted areas (i.e. roads) whenever possible.

Erosion Control: Erosion Control activities would involve improvements to existing access roads, culverts, and other areas of non-point source pollution. Installation of erosion control practices reduces sediment and improves water quality and habitat for aquatic species. Erosion control activities include one or more of the following activities:

- Access Road Improvements - Improvement of an existing road to prevent erosion and maintain or improve water quality. An example of this activity might include re-grading, outsloping, or the addition of a rolling dip to a road so that water is less erosive as it travels across the road. This activity may also be used for repair, removal, or installation of culverts (water control structures) in non-fish bearing streams associated with access road improvements. In some cases this practice may also be used to decommission improperly placed roads (i.e. road that impacts habitat such as a seep area or a road that is too steep and contributing significant erosion) and re-route a new road to a more appropriate path.

- Vegetation Establishment - Planting, maintenance and establishment of native or non-persistent, non-invasive vegetation to reduce erosion and non-point source pollution to waterways, while also enhancing habitat. This activity includes critical area planting, installation of filter strips and grassed waterways.

- Water Control Structures - Installation of a structure in a drainage, stream, or gully, that conveys water, controls the direction or rate of flow, or maintains a desired water surface elevation, such as culverts, pipe drops or chutes within gullies, debris screens, etc. These structures are used to replace or retrofit existing culverts that are either not functioning properly or are a barrier to fish passage. The placement of new culverts, when environmentally beneficial, is also included in this practice.

Minimization Measures

General Minimization Measures

1. At least 15 days prior to the onset of any construction-related activities, NRCS shall submit to the Service, for approval, the name(s) and credentials of individuals it wishes to conduct activities specified for this Programmatic Biological Opinion. Information included in a request for authorization should include, at a minimum: (1) relevant education; (2) relevant training on species identification, survey techniques, handling individuals of different age classes, and handling of different life stages by a permitted biologist or recognized species expert authorized for such activities by the Service; (3) a summary of field experience conducting requested activities (to include project/research information); (4) a summary of biological opinions under which they were authorized to work with the listed species and at what level (such as construction monitoring versus handling), this should also include the names and qualifications of persons under which the work was supervised as well as the amount of work experience on the actual project; (5) A list of Federal Recovery Permits [10(a)1(A)] held or under which are authorized to work with the species (to include permit #, authorized activities, and name of permit holder); and (6) any relevant professional references with contact information. No project construction shall begin until NRCS has received written Service approval for individuals to conduct specified activities.

2. Prior to construction, an education program will be conducted for the cooperator and/or any construction employee in reference to potential listed species on site. At minimum, the program will consist of a brief presentation by persons knowledgeable in endangered species biology and legislative protection (Service-approved individual). The program will include: a description of the species and their habitat needs; any reports of occurrences in the project area; an explanation of the status of each listed species and their protection under the Act; and a list of measures being taken to reduce effects to the species during construction and implementation. Fact sheets conveying this information and color photographs of all listed species in the work area(s) will be prepared for distribution to the above-mentioned people and anyone else who may enter the project area. A list of education program attendees will be maintained by the applicant to be made available for review by the Service upon request.

3. A preconstruction survey for potential listed species on site will be performed immediately prior to groundbreaking activities. The survey will be conducted by Service-approved individuals. If at any point, construction activities cease for more than five consecutive days, an additional preconstruction survey will be conducted prior to the resumption of these actions.

4. To prevent the accidental entrapment of listed species during construction, all excavated holes or trenches deeper than 6 inches will be covered at the end of each work day with plywood or similar materials. Foundation trenches or larger excavations that cannot easily be covered will be ramped at the end of the work day to allow trapped animals an escape method. Trenches and holes shall be checked every morning prior to construction activity. In the event of a trapped animal is observed, construction will cease until the individual has been relocated to an appropriate location.

5. All construction pipes, culverts, or similar structures that are stored in the project area for one or more overnight periods shall be securely capped prior to storage or thoroughly inspected for animals if the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a listed species is present in the structure, a Service-approved individual shall be notified immediately and construction will cease until the individual has been relocated to an appropriate location.

6. Only Service-approved individuals will conduct surveys and move listed species.

7. All trash and debris within the work area will be placed in containers with secure lids before the end of each work day in order to reduce the likelihood of predators being attracted to the site by discarded food rappers and other rubbish that may be left on-site. Containers will be emptied as necessary to prevent trash overflow onto the site and all rubbish will be disposed of at an appropriate off-site location.

8. Grading and construction activities will be limited to April 1 – November 15. Should the applicant demonstrate a need to conduct activities outside this period, NRCS may authorize such activities after obtaining the Service's approval.

9. Ground disturbing activities shall occur only during daylight hours.

10. NRCS projects will be designed to minimize off-site stormwater runoff that might otherwise impact surrounding aquatic habitat. When soil disturbance is necessary, standard construction Best Management Practices (BMPs) will be incorporated into construction designs, plans, specifications, and required of contractors during

construction. BMPs utilized by NRCS are available in the *California Salmonid Stream Habitat Restoration Manual*, pages IX-50 and IX-51 (CDFG 1998a).

11. A Service-approved individual shall ensure that the spread or introduction of invasive exotic plant species shall be avoided to the maximum extent possible. When practicable, invasive exotic plants in the project areas shall be removed.

12. Use of herbicides will occur according to labeled directions and local, State, and Federal regulations and guidelines, including the interim protective measures as described in the Environmental Protection Agency's stipulated injunction for pesticide use. No other pesticide use is covered under this biological opinion. Activities shall be limited to the dry period of the year and shall be restricted to periods of low rainfall (less than ¼ inch per 24 hour period), time periods with less than a 30 percent chance of rain, or dry weather periods. If rain is predicted based on the above criteria, within 72 hours during project activity, all activities shall cease until no further rain is forecast.

13. No plastic mono-filament erosion control matting shall be used for erosion control within the entire project site.

14. If a work site is to be temporarily dewatered by pumping, intakes shall be completely screened with wire mesh not larger than 5 millimeters. Water shall be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any barriers to flow shall be removed in a manner that would allow flow to resume with the least disturbance to the substrate.

15. Staging areas for construction equipment will be located so that spills of oil, grease or other petroleum by-products will not be discharged into any watercourse or sensitive habitat. No refueling, storage, servicing, or maintenance of equipment will take place within 50 feet of aquatic features. All machinery will be properly maintained and cleaned to prevent spills and leaks. Any spills or leaks from the equipment will be reported and cleaned up in accordance with applicable local, State and/or Federal regulations.

16. A Service-approved individual shall permanently remove, from within the project area, any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible. The applicant shall have the responsibility to ensure that their activities are in compliance with the California Fish and Game Code.

17. The Service must be notified within one (1) working day of the finding of any injured listed species or any unanticipated damage to its habitat associated with the proposed project. Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as the Service-approved individual. Notification must include the date, time, and precise location of the individual/incident clearly indicated on a U.S. Geological Survey 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information. Dead individuals must be sealed in a resealable plastic bag containing a paper with the date and time when the animal was found, the location where it was found, and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site. The Service contact persons are the Coast Bay/Forest Foothills Division Chief of the Endangered Species Program at the Sacramento Fish and Wildlife Office at (916) 414-6600; and the Resident Agent-in-Charge of the Service's Division of Law Enforcement, 2800 Cottage Way, Room W-2928, Sacramento, California 95825, at (916) 414-6660.

18. NRCS shall submit an annual report to the Service by December 31st each year. This report shall detail: (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting Conservation Measures; (iii) an explanation of failure to meet such measures, if any; (iv) quantified actual ground disturbance with photographs (v) known project effects on listed species, if any; (vi) occurrences of incidental take of listed species, if any; (vii) documentation of employee environmental education; and (viii) other pertinent information.

Species Specific Minimization Measures

Callippe Silverspot Butterfly

1. Preconstruction surveys for the larval food plants of callippe silverspot butterfly will be conducted during typical bloom season during a period from January through April. Any larval food plants found within 300 feet of the project footprint will be clearly marked with pin flagging. Flagged areas will be avoided to the maximum extent practicable and if possible, fenced for avoidance.

2. No herbicides, pesticides, or fertilizers will be applied in areas that are occupied by *Viola pedunculata*. No herbicides, pesticides, or fertilizers will be applied within 300 feet of areas that are occupied by *Viola pedunculata*.

California Red-Legged Frog and Central California Tiger Salamander

1. Restoration activities at ponds occupied by California red-legged frogs and/or Central California tiger salamanders will take place between August 31-October 31 (or the first rainfall of the season depositing more than 0.25 inch) when larval development of red-

legged frogs and tiger salamanders is likely to be complete and ponds have less water present, unless restoration activities do not impact pond vegetation or water.

2. A Service-approved individual shall survey the work site immediately prior to construction activities. If California red-legged frogs and/or Central California tiger salamander adults, larvae, or eggs are found, the Service-approved individual will determine if moving any of these life-stages is appropriate. In making this determination the Service-approved individual shall consider if an appropriate relocation site exists. The Service-approved individual shall be allowed sufficient time to move California red-legged frogs and/or Central California tiger salamanders from the work site before work activities begin.

3. Bare hands shall be used to capture red-legged frogs and/or tiger salamanders. Service-approved individuals will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two hours before and during periods when they are capturing and relocating individuals. To avoid transferring disease or pathogens of handling of the amphibians, Service-approved individuals will follow the Declining Amphibian Populations Task Force's "Code of Practice."

4. Only Service-approved individuals will capture, handle, and relocate California red-legged frogs and Central California tiger salamanders. NRCS will contact the Service prior to relocating California red-legged frogs and Central California tiger salamanders to determine where the species can be relocated.

5. A Service-approved individual shall be present on site during all grading, dewatering, riparian or aquatic vegetation removal, in-stream construction activities, and relocation of California red-legged frogs and/or Central California tiger salamanders. After instruction of project personnel, relocation of California red-legged frogs and/or Central California tiger salamanders, and the activities listed above have been completed, the Service-approved individual shall designate a person to monitor on-site compliance. The Service-approved individual shall ensure that this individual receives the training specified in general protective measure 2 and is competent in the identification of California red-legged frogs and/or Central California tiger salamanders.

6. All burrows that provide upland habitat will be avoided to the maximum extent feasible. Areas with high concentrations of burrows will be flagged and avoided.

7. Sediment removed during pond and/or stream restoration activities will not be placed where it can enter into California red-legged frogs and/or Central California tiger

salamanders breeding pools; nor will it pass into any other waters of the State. Sediment will not be placed over areas with concentrated ground squirrel burrows.

Alameda Whipsnake

1. All rock outcroppings will be avoided.

2. Disturbance in known or potential Alameda whipsnake habitat shall only take place between June 15 - October 31, when the whipsnake is more active and less likely to be impacted.

3. Pipeline installation for livestock water systems will follow existing roads and trails to the maximum extent possible. When existing roads and trails cannot be followed, and disturbance is in known or potential Alameda whipsnake habitat, shrub and understory vegetation will be removed by hand to prevent mortality associated with mowers and other landscaping equipment. A Service-approved individual experienced in identifying Alameda whipsnakes will be present during vegetation removal.

San Joaquin Kit Fox

1. If the NRCS Service-approved individual determines that there is potential for kit foxes or their dens to be present within that upland habitat, then the project will adhere to the current Standard Recommendations for the Protection of the San Joaquin kit fox Prior to or During Ground Disturbance.

Action Area

The action area includes the entire county but primarily serves the ranching and farming community in the eastern, rural portion of Alameda County and land managers that manage properties on creeks in rural-urban interface areas. Alameda County encompasses an area of 469,400 acres and is situated in the greater San Francisco East Bay region. The majority of the county's population lives in the highly urbanized area along the easternmost portion of San Francisco Bay. This western portion of Alameda County includes the cities of Alameda, Berkeley, Fremont, Hayward, Oakland and San Leandro. The more rural, eastern portion supports ranching and farming, with an urban/suburban center located in the Tri-Valley region of Dublin, Livermore, and Pleasanton. The county is approximately 50 percent agricultural land and 50 percent urban lands.

The major watersheds in Alameda County are Alameda Creek, San Leandro Creek, and San Lorenzo Creek watersheds. The majority of projects would occur within these three watersheds. Some smaller watersheds in Alameda County are Arroyo Viejo; East Creek Watershed; Estudillo Canal; Ettie Pump Station; Laguna Creek; Lion Creek; Mowry Slough; San Antonio Creek (or Oakland Estuary); Sausal Creek; Strawberry Creek; and Temescal Creek watersheds. These

smaller watersheds are predominately located in urbanized areas.
The action area would not include projects in any of the following habitats or areas:

- Salt marsh and estuary projects in the Alameda County's bayfront area.
- Serpentine soils or alkali-sink habitat in the work area
- Known pallid manzanita occurrences

Consequently, projects in the habitats and specific locations identified above would be excluded from the action area. Land managers working with NRCS on proposed projects in these particular areas and habitats would need to seek individual permits on a project-by-project basis.

Analytical Framework for the Jeopardy and Adverse Modification Analyses

Jeopardy Determination

In accordance with policy and regulation, the jeopardy analysis in this Programmatic Biological Opinion relies on four components: (1) the Status of the Species, which evaluates the callippe silverspot butterfly, California red-legged frog, Central California tiger salamander, Alameda whipsnake, and San Joaquin kit fox's range-wide condition, the factors responsible for that condition, and their survival and recovery needs; (2) the Environmental Baseline, which evaluates the condition of the five species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the these listed animals; (3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the callippee silverspot butterfly, California red-legged frog, Central California tiger salamander, Alameda whipsnake, and San Joaquin kit fox; and, (4) the Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on them.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the callippe silverspot butterfly, California red-legged frog, Central California tiger salamander, Alameda whipsnake, and San Joaquin kit fox's current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of these five species in the wild.

The jeopardy analysis in this Programmatic Biological Opinion places an emphasis on consideration of the range-wide survival and recovery needs of the callippe silverspot butterfly, California red-legged frog, Central California tiger salamander, Alameda whipsnake, and San Joaquin kit fox and the role of the action area in their survival and recovery as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Adverse Modification Determination

This Programmatic Biological Opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the

statutory provisions of the Act to complete the following analysis with respect to critical habitat. In accordance with policy and regulation, the adverse modification analysis in this Programmatic Biological Opinion relies on four components: (1) the Status of Critical Habitat, which evaluates the rangewide condition of proposed critical habitat for the California red-legged frog, Central California tiger salamander, and Alameda whipsnake in terms of primary constituent elements (PCE)s, the factors responsible for that condition, and the intended recovery function of the critical habitat at the provincial and range-wide scale; (2) the Environmental Baseline, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the PCEs and how that will influence the recovery role of affected critical habitat units and; (4) Cumulative Effects which evaluates the effects of future, non-Federal activities in the action area on the PCEs and how that will influence the recovery role of affected critical habitat units.

For purposes of the adverse modification determination, the effects of the proposed Federal action on the California red-legged frog, Central California tiger salamander, and Alameda whipsnake critical habitat are evaluated in the context of the range-wide condition of the critical habitat at the provincial and range-wide scales, taking into account any cumulative effects, to determine if the critical habitat range-wide would remain functional (or would retain the current ability for the PCEs to be functionally established in areas of currently unsuitable but capable habitat) to serve its intended recovery role for the California red-legged frog, Central California tiger salamander, and Alameda whipsnake.

The analysis in this Programmatic Biological Opinion places an emphasis on using the intended range-wide recovery function of California red-legged frog, Central California tiger salamander, and Alameda whipsnake critical habitat and the role of the action area relative to that intended function as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the adverse modification determination.

Status of the Species

Callippe Silverspot Butterfly

Refer to the *Callippe Silverspot Butterfly* (*Speyeria callippe callippe*) *5-Year Review: Summary and Evaluation* (Service 2009a) for the current Status of the Species.

California Red-Legged Frog

Listing Status: The California red-legged frog was listed as a threatened species on May 23, 1996 (61 FR 25813) (Service 1996). Critical habitat was designated for this species on April 13, 2006 (71 FR 19244) (Service 2006b) and revisions to the critical habitat designation were published on March 17, 2010 (75 FR 12816) (Service 2010). At this time, the Service recognized the taxonomic change from *Rana aurora draytonii* to *Rana draytonii* (Shaffer *et al.*

2010). A Recovery Plan was published for the California red-legged frog on September 12, 2002 (Service 2002a).

Species Description: The California red-legged frog is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 2003). The abdomen and hind legs of adults are largely red, while the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 2003), and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 0.6 to 3.1 inches in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

Distribution: The historic range of the California red-legged frog extended from the vicinity of Elk Creek in Mendocino County, California, along the coast inland to the vicinity of Redding in Shasta County, California, and southward to northwestern Baja California, Mexico (Fellers 2005; Jennings and Hayes 1985; Hayes and Krempels 1986). The species was historically documented in 46 counties but the taxa now remains in 238 streams or drainages within 23 counties, representing a loss of 70 percent of its former range (Service 2002a). California red-legged frogs are still locally abundant within portions of the San Francisco Bay area and the Central California Coast. Isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse Ranges. The species is believed to be extirpated from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico (CDFG 2012).

Status and Natural History: California red-legged frogs predominately inhabit permanent water sources such as streams, lakes, marshes, natural and manmade ponds, and ephemeral drainages in valley bottoms and foothills up to 4,921 feet in elevation (Jennings and Hayes 1994, Bulger *et al.* 2003, Stebbins 2003). However, they also inhabit ephemeral creeks, drainages and ponds with minimal riparian and emergent vegetation. California red-legged frogs breed from November to April, although earlier breeding records have been reported in southern localities. Breeding generally occurs in still or slow-moving water often associated with emergent vegetation, such as cattails, tules or overhanging willows (Storer 1925, Hayes and Jennings 1988). Female frogs deposit egg masses on emergent vegetation so that the egg mass floats on or near the surface of the water (Hayes and Miyamoto 1984).

Habitat includes nearly any area within 1-2 miles of a breeding site that stays moist and cool through the summer, including vegetated areas with coyote brush, California blackberry thickets, and root masses associated with willow and California bay trees (Fellers 2005). Sheltering habitat for California red-legged frogs potentially includes all aquatic, riparian, and upland areas within the range of the species and includes any landscape feature that provides cover, such as animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris. Agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay stacks may also be used. Incised stream channels with portions narrower and depths greater than 18 inches also may provide important summer sheltering habitat. Accessibility to sheltering

habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting frog population numbers and survival.

California red-legged frogs do not have a distinct breeding migration (Fellers 2005). Adults are often associated with permanent bodies of water. Some individuals remain at breeding sites year-round, while others disperse to neighboring water features. Dispersal distances are typically less than 0.5-mile, with a few individuals moving up to 1-2 miles (Fellers 2005). Movements are typically along riparian corridors, but some individuals, especially on rainy nights, move directly from one site to another through normally inhospitable habitats, such as heavily grazed pastures or oak-grassland savannas (Fellers 2005).

In a study of California red-legged frog terrestrial activity in a mesic area of the Santa Cruz Mountains, Bulger *et al.* (2003) categorized terrestrial use as migratory and non-migratory. The latter occurred from one to several days and was associated with precipitation events. Migratory movements were characterized as the movement between aquatic sites and were most often associated with breeding activities. Bulger *et al.* (2003) reported that non-migrating frogs typically stayed within 200 feet of aquatic habitat 90 percent of the time and were most often associated with dense vegetative cover, i.e., California blackberry, poison oak and coyote brush. Dispersing frogs in northern Santa Cruz County traveled distances from 0.25-mile to more than 2 miles without apparent regard to topography, vegetation type, or riparian corridors (Bulger *et al.* 2003).

In a study of California red-legged frog terrestrial activity in a xeric environment in eastern Contra Costa County, Tatarian (2008) noted that a 57 percent majority of frogs fitted with radio transmitters in the Round Valley study area stayed at their breeding pools, whereas 43 percent moved into adjacent upland habitat or to other aquatic sites. Her study reported a peak seasonal terrestrial movement occurring in the fall months associated with the first 0.2-inch of precipitation and tapering off into spring. Upland movement activities ranged from 3 to 233 feet, averaging 80 feet, and were associated with a variety of refugia including grass thatch, crevices, cow hoof prints, ground squirrel burrows at the base of trees or rocks, logs, and under man-made structures; others were associated with upland sites lacking refugia (Tatarian 2008). The majority of terrestrial movements lasted from 1 to 4 days; however, one adult female was reported to remain in upland habitat for 50 days (Tatarian 2008). Upland refugia closer to aquatic sites were used more often and were more commonly associated with areas exhibiting higher object cover, e.g., woody debris, rocks, and vegetative cover. Subterranean cover was not significantly different between occupied upland habitat and non-occupied upland habitat.

California red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Egg masses containing 2,000 to 5,000 eggs are attached to vegetation below the surface and hatch after 6 to 14 days (Storer 1925, Jennings and Hayes 1994). In coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity (Jennings *et al.* 1992). Eggs exposed to salinity levels greater than 4.5 parts per thousand resulted in 100 percent mortality (Jennings and Hayes 1990). Increased siltation during the breeding season can cause asphyxiation of eggs

and small larvae. Larvae undergo metamorphosis 3½ to 7 months following hatching and reach sexual maturity 2 to 3 years of age (Storer 1925; Wright and Wright 1949; Jennings and Hayes 1985, 1990, 1994). Of the various life stages, larvae probably experience the highest mortality rates, with less than 1 percent of eggs laid reaching metamorphosis (Jennings *et al.* 1992). California red-legged frogs may live 8 to 10 years (Jennings *et al.* 1992). Populations can fluctuate from year to year; favorable conditions allow the species to have extremely high rates of reproduction and thus produce large numbers of dispersing young and a concomitant increase in the number of occupied sites. In contrast, the animal may temporarily disappear from an area when conditions are stressful (e.g., during periods of drought, disease, etc.).

The diet of California red-legged frogs is highly variable and changes with the life history stage. The diet of the larvae is not well studied, but is likely similar to that of other ranid frogs which feed on algae, diatoms, and detritus by grazing on the surface of rocks and vegetation (Fellers 2005; Kupferberg 1996a, 1996b, 1997). Hayes and Tennant (1985) analyzed the diets of California red-legged frogs from Cañada de la Gaviota in Santa Barbara County during the winter of 1981 and found invertebrates (comprising 42 taxa) to be the most common prey item consumed; however, they speculated that this was opportunistic and varied based on prey availability. They ascertained that larger frogs consumed larger prey and were recorded to have preyed on Pacific chorus frog, three-spined stickleback and, to a limited extent, California mice, which were abundant at the study site (Hayes and Tennant 1985, Fellers 2005). Although larger vertebrate prey was consumed less frequently, it represented over half of the prey mass eaten by larger frogs suggesting that such prey may play an energetically important role in their diets (Hayes and Tennant 1985). Juvenile and subadult/adult frogs varied in their feeding activity periods; juveniles fed for longer periods throughout the day and night, while subadult/adults fed nocturnally (Hayes and Tennant 1985). Juveniles were significantly less successful at capturing prey and all life history stages exhibited poor prey discrimination, feeding on several inanimate objects that moved through their field of view (Hayes and Tennant 1985).

Threats: Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the California red-legged frog throughout its range. Several researchers in central California have noted the decline and eventual local disappearance of California and northern red-legged frogs in systems supporting bullfrogs (Jennings and Hayes 1990; Twedt 1993), red swamp crayfish, signal crayfish, and several species of warm water fish including sunfish, goldfish, common carp, and mosquitofish (Moyle 1976; Barry 1992; Hunt 1993; Fisher and Schaffer 1996). This has been attributed to predation, competition, and reproduction interference. Twedt (1993) documented bullfrog predation of juvenile northern red-legged frogs, and suggested that bullfrogs could prey on subadult California red-legged frogs as well. Bullfrogs may also have a competitive advantage over California red-legged frogs. For instance, bullfrogs are larger and possess more generalized food habits (Bury and Whelan 1984). In addition, bullfrogs have an extended breeding season (Storer 1933) during which an individual female can produce as many as 20,000 eggs (Emlen 1977).

The urbanization of land within and adjacent to California red-legged frog habitat has also affected the threatened amphibian. These declines are attributed to channelization of riparian areas, enclosure of the channels by urban development that blocks dispersal, and the introduction

of predatory fishes and bullfrogs. Diseases may also pose a significant threat, although the specific effects of disease on the California red-legged frog are not known. Pathogens are suspected of causing global amphibian declines (Garner *et al.* 2006). Chytridiomycosis and ranaviruses are a potential threat because these diseases have been found to adversely affect other amphibians, including the California red-legged frog. Non-native species, such as bullfrogs and non-native tiger salamanders that live within the range of the California red-legged frog have been identified as potential carriers of these diseases (Garner *et al.* 2006). Humans can facilitate the spread of disease by encouraging the further introduction of non-native carriers and by acting as carriers themselves (i.e., contaminated boots, waders or fishing equipment). Human activities can also introduce stress by other means, such as habitat fragmentation, which results in the listed species being more susceptible to the effects of disease.

Recovery Plan: The Recovery Plan for the California red-legged frog identifies eight recovery units (Service 2002). The establishment of these recovery units is based on the determination that various regional areas of the species' range are essential to its survival and recovery. These recovery units are delineated by major watershed boundaries as defined by U.S. Geological Survey hydrologic units and the limits of its range. The goal of the Recovery Plan is to protect the long-term viability of all extant populations within each recovery unit. Within each recovery unit, core areas have been delineated and represent contiguous areas of moderate to high California red-legged frog densities that are relatively free of exotic species such as bullfrogs. The goal of designating core areas is to protect metapopulations. Thus when combined with suitable dispersal habitat, will allow for the long term viability within existing populations. The management strategy identified within the Recovery Plan will allow for the recolonization of habitats within and adjacent to core areas that are naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of California red-legged frogs.

California Red-Legged Frog Critical Habitat

The Service designated critical habitat for the California red-legged frog on April 13, 2006 (Service 2006b) and a revised designation to the critical habitat was published on March 17, 2010 (Service 2010). At this time, the Service recognized the taxonomic change from *Rana aurora draytonii* to *Rana draytonii* (Shaffer *et al.* 2010). The PCEs defined for the California red-legged frog were derived from its biological needs. The area designated as revised critical habitat provides aquatic habitat for breeding and non-breeding activities and upland habitat for shelter, foraging, predator avoidance, and dispersal across its range. The PCEs and, therefore, the resulting physical and biological features essential for the conservation of the species were determined from studies of California red-legged frog ecology. Based on the above needs and our current knowledge of the life history, biology, and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, the Service determined that the PCEs essential to the conservation of the California red-legged frog are: (1) aquatic breeding habitat defined as standing bodies of fresh water (with salinities less than 7.0 parts per thousand), including: natural and manmade (e.g., stock) ponds, slow-moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years; (2) non-breeding aquatic habitat defined as freshwater and wetted riparian habitats, as

described above, that may not hold water long enough for the subspecies to hatch and complete its aquatic life cycle but that do provide for shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult California red-legged frogs. Other wetland habitats that would 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 defined as upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of 1 mile in most cases and comprised of various vegetational series such as grasslands, woodlands, wetland, or 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 should include structural features such as boulders, rocks and organic debris (e.g., downed trees, logs), as well as small mammal burrows and moist leaf litter and; (4) dispersal habitat defined as accessible upland or riparian dispersal habitat within designated units and between occupied locations within a minimum of 1 mile of each other and 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 (e.g., heavily traveled road without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large reservoirs over 50 acres in size, or other areas that do not contain those features identified in PCEs 1, 2, or 3 as essential to the conservation of the subspecies.

With the revised designation of critical habitat, the Service intends to conserve the geographic areas containing the physical and biological features that are essential to the conservation of the species, through the identification of the appropriate quantity and spatial arrangement of the PCEs sufficient to support the life-history functions of the species. Not all life-history functions require all the PCEs and not all areas designated as critical habitat will contain all the PCEs. Refer to the final designation of critical habitat for California red-legged frog for additional information.

Central California Tiger Salamander

Listing Status: On May 23, 2003, we proposed to list the Central California DPS of the tiger salamander as threatened. At that time, we also proposed reclassification of the Santa Barbara County DPS and Sonoma County DPS from endangered to threatened (68 FR 28647) (Service 2003). In the same notice, we also proposed a special rule under section 4(d) of the Act to exempt take for routine ranching operations for the Central California DPS and, if reclassified to threatened, for the Santa Barbara and Sonoma County DPSs (68 FR 28668) (Service 2003).

On August 4, 2004, after determining that the listed Central California population of the California DPS of the Central California tiger salamander was threatened (69 FR 47211) (Service 2004), we determined that the Santa Barbara and Sonoma County populations were threatened as well, and reclassified the Central California tiger salamander as threatened throughout its range, removing the Santa Barbara and Sonoma County populations as separately listed DPSs. In this notice, we also finalized the special rule to exempt take for routine ranching operations for the Central California tiger salamander throughout its range (Service 2004).

On August 18, 2005, as a result of litigation of the August 4, 2004 final rule on the reclassification of the California tiger salamander DPSs (*Center for Biological Diversity et al.* v. *United States Fish and Wildlife Service et al.*, C 04-04324 WHA [N.D. Cal. 2005]), the District Court of Northern California sustained the portion of the 2004 rule pertaining to listing the Central California tiger salamander as threatened with a special rule, vacated the 2004 rule with regard to the Santa Barbara and Sonoma DPSs, and reinstated their prior listing as endangered. The List of Endangered and Threatened Wildlife in part 17, subchapter B of Chapter I, title 50 of the CFR has not been amended to reflect the vacatures contained in this order, and continues to show the rangewide reclassification of the California tiger salamander (salamander[s]) as a threatened species with a special rule. We are currently in the process of correcting the CFR to reflect the current status of the species throughout its range.

Species Description: The California tiger salamander is a large, stocky, terrestrial salamander with a broad, rounded snout. Recorded adult measurements have been as much as 8.2 inches long (Petranka 1998; Stebbins 2003). California tiger salamanders exhibit sexual dimorphism (differences in body appearance based on gender) with males tending to be larger than females. The coloration of the adults generally consists of random white or yellowish markings against a black body. The markings tend to be more concentrated on the lateral sides of the body; whereas other salamander species tend to have brighter yellow spotting that is heaviest on the dorsal surface.

Distribution: The California tiger salamander is endemic to California and historically inhabited the low-elevation grassland and oak savanna plant communities of the Central Valley, adjacent foothills, and Inner Coast Ranges (Jennings and Hayes 1994; Storer 1925; Shaffer *et al.* 1993). The species has been recorded from near sea level to approximately 3,900 feet in the Coast Ranges and to approximately 1,600 feet in the Sierra Nevada foothills (Shaffer and Trenham 2004). Along the Coast Ranges, the species occurred from the Santa Rosa area of Sonoma County, south to the vicinity of Buellton in Santa Barbara County. The historic distribution in the Central Valley and surrounding foothills included northern Yolo County southward to northwestern Kern County and northern Tulare County.

The Central California tiger salamander occupies the Bay Area (central and southern Alameda, Santa Clara, western Stanislaus, western Merced, and the majority of San Benito counties), Central Valley (Yolo, Sacramento, Solano, eastern Contra Costa, northeastern Alameda, San Joaquin, Stanislaus, Merced, and northwestern Madera counties), southern San Joaquin Valley (portions of Madera, central Fresno, and northern Tulare and Kings Counties), and the Central Coast Range (southern Santa Cruz, Monterey, northern San Luis Obispo, and portions of western

San Benito, Fresno, and Kern counties).

Life History: The California tiger salamander has an obligate biphasic life cycle (Shaffer *et al.* 2004). Although the larvae develop in the vernal pools and ponds in which they were born, the species is otherwise terrestrial and spend most of their post-metamorphic lives in widely dispersed underground retreats (Shaffer *et al.* 2004; Trenham *et al.* 2001). Because they spend most of their lives underground, the animals rarely are encountered even in areas where California tiger salamanders are abundant. Subadult and adult California tiger salamanders typically spend the dry summer and fall months in the burrows of small mammals, such as California ground squirrels and Botta's pocket gopher (Storer 1925; Loredo and Van Vuren 1996; Petranka 1998; Trenham 1998a). Although ground squirrels have been known to eat these amphibians, the relationship with their burrowing hosts is primarily commensal (an association that benefits one member while the other is not affected) (Loredo *et al.* 1996; Semonsen 1998).

California tiger salamanders may also use landscape features such as leaf litter or desiccation cracks in the soil for upland refugia. Burrows often harbor camel crickets and other invertebrates that provide likely prey for the amphibians. Underground refugia also provide protection from the sun and wind associated with the dry California climate that can cause excessive drying of amphibian skin. Although California tiger salamanders are members of a family of "burrowing" salamanders, they are not known to create their own burrows. This may be due to the hardness of soils in the California ecosystems in which they are found. California tiger salamanders depend on persistent small mammal activity to create, maintain, and sustain sufficient underground refugia for the species. Burrows are short lived without continued small mammal activity and typically collapse within approximately 18 months (Loredo *et al.* 1996).

Upland burrows inhabited by California tiger salamanders have often been referred to as aestivation-sites. However, "aestivation" implies a state of inactivity, while most evidence suggests that the animals remain active in their underground dwellings. One study has found that salamanders move, feed, and remain active in their burrows (Van Hattem 2004). Because adults arrive at breeding ponds in good condition and are heavier when entering the pond than when leaving, researchers have long inferred that they are feeding while underground. A number of direct observations have confirmed this (Trenham 2001; Van Hattem 2004). Thus, "upland habitat" is a more accurate description of the terrestrial areas used by California tiger salamanders.

California tiger salamanders typically emerge from their underground refugia at night during the fall or winter rainy season (November-May) to migrate to their breeding ponds (Stebbins 1985, 1989; Shaffer *et al.* 1993; Trenham *et al.* 2000). The breeding period is closely associated with the rainfall patterns in any given year with less adults migrating and breeding in drought years (Loredo and Van Vuren 1996; Trenham *et al.* 2000). Male California tiger salamander are typically first to arrive and generally remain in the ponds longer than females. Results from a 7-year study in Monterey County suggested that males remained in the breeding ponds for an average of 44.7 days while females remained for an average of only 11.8 days (Trenham *et al.* 2000). Historically, breeding ponds were likely limited to vernal pools, but now include livestock stock ponds. Ideal breeding ponds are typically fishless, free of non-native predators,

and seasonal or semi-permanent (Barry and Shaffer 1994; Petranka 1998).

While in the ponds, adult California tiger salamanders mate and then the females lay their eggs in the water (Twitty 1941; Shaffer *et al.* 1993; Petranka 1998). Egg laying typically reaches a peak in January (Loredo and Van Vuren 1996; Trenham *et al.* 2000). Females attach their eggs singly, or in rare circumstances, in groups of two to four, to twigs, grass stems, vegetation, or debris (Storer 1925; Twitty 1941). Eggs are often attached to objects, such as rocks and boards in ponds with no or limited vegetation (Jennings and Hayes 1994). Clutch sizes from a Monterey County study had an average of 814 eggs (Trenham *et al.* 2000). Seasonal pools may not exhibit sufficient depth, persistence, or other necessary parameters for adult breeding during times of drought (Barry and Shaffer 1994). After breeding and egg laying is complete, adults leave the pool and return to their upland refugia (Loredo *et al.* 1996; Trenham 1998a). Adult California tiger salamanders often continue to emerge nightly for approximately the next two weeks to feed amongst their upland habitat (Shaffer *et al.* 1993).

California tiger salamander larvae typically hatch within 10 to 24 days after eggs are laid (Storer 1925). The larvae are totally aquatic and range in length from approximately 0.45 to 0.56 inches (Petranka 1998). They have yellowish gray bodies, broad fat heads, large, feathery external gills, and broad dorsal fins that extend well up their back. The larvae feed on zooplankton, small crustaceans, and aquatic insects for about six weeks after hatching, after which they switch to larger prey (J. Anderson 1968). Larger larvae have been known to consume the tadpoles of Pacific tree frogs, western spadefoot toads, and California red-legged frogs (J. Anderson 1968; P. Anderson 1968). California tiger salamander larvae are among the top aquatic predators in seasonal pool ecosystems. When not feeding, they often rest on the bottom in shallow water but are also found throughout the water column in deeper water. Young California tiger salamanders are wary and typically escape into vegetation at the bottom of the pool when approached by potential predators (Storer 1925).

The California tiger salamander larval stage is typically completed in 3 to 6 months with most metamorphs entering upland habitat during the summer (Petranka 1998). In order to be successful, the aquatic phase of this species' life history must correspond with the persistence of its seasonal aquatic habitat. Most seasonal ponds and pools dry up completely during the summer. Amphibian larvae must grow to a critical minimum body size before they can metamorphose (change into a different physical form) to the terrestrial stage (Wilbur and Collins 1973). Larval development and metamorphosis can vary and is often site-dependent. Larvae collected near Stockton in the Central Valley during April varied between 1.88 to 2.32 inches in length (Storer 1925). Feaver (1971) found that larvae metamorphosed and left breeding pools 60 to 94 days after eggs had been laid, with larvae developing faster in smaller, more rapidly drying pools. Longer ponding duration typically results in larger larvae and metamorphosed juveniles that are more likely to survive and reproduce (Pechmann *et al.* 1989; Semlitsch *et al.* 1988; Morey 1998; Trenham 1998b). Larvae will perish if a breeding pond dries before metamorphosis is complete (P. Anderson 1968; Feaver 1971). Pechmann *et al.* (1989) found a strong positive correlation between ponding duration and total number of metamorphosing juveniles in five salamander species. In Madera County, Feaver (1971) found that only 11 of 30 sampled pools supported larval salamanders, and 5 of these dried before metamorphosis could occur.

Therefore, out of the original 30 pools, only 6 (20 percent) provided suitable conditions for successful reproduction that year. Size at metamorphosis is positively correlated with stored body fat and survival of juvenile amphibians, and negatively correlated with age at first reproduction (Semlitsch *et al.* 1988; Scott 1994; Morey 1998).

Following metamorphosis, juvenile California tiger salamanders leave their pools and move to upland habitat. This emigration can occur in both wet and dry conditions (Loredo and Van Vuren 1996; Loredo *et al.* 1996). Wet conditions are more favorable for upland travel but summer rain events seldom occur as metamorphosis is completed and ponds begin to dry. As a result, juveniles may be forced to leave their ponds on rainless nights. Under dry conditions, juveniles may be limited to seeking upland refugia in close proximity to their aquatic larval pool. These individuals often wait until the next winter's rains to move further into more suitable upland refugia. The peak emergence of these metamorphs in ponds is typically between mid-June and mid-July (Loredo and Van Vuren 1996; Trenham et al. 2000). Juveniles remain active in their upland habitat, emerging from underground refugia during rainfall events to disperse or forage (Trenham and Shaffer 2005). Depending on location and other development factors, metamorphs will not return as adults to aquatic breeding habitat for 2 to 5 years (Loredo and Van Vuren 1996; Trenham *et al.* 2000).

Reproductive success for the California tiger salamander is low. Results from one study suggest that the average female bred 1.4 times over their lifespan and produced 8.5 young per reproductive effort that survived to metamorphosis (Trenham *et al.* 2000). This resulted in the output of roughly 11 metamorphic offspring over a breeding female's lifetime. The primary reason for low reproductive success may be that this relatively short-lived species requires two or more years to become sexually mature (Shaffer *et al.* 1993). Some individuals may not breed until they are 4 to 6 years old. While California tiger salamanders may survive for more than 10 years, many breed only once, and in one study, less than 5 percent of marked juveniles survived to become breeding adults (Trenham 1998b). With such low recruitment, isolated populations are susceptible to unusual, randomly occurring natural events as well human-caused factors that reduce breeding success and individual survival. Factors that repeatedly lower breeding success in isolated pools can quickly extirpate a population.

Dispersal and migration movements made by California tiger salamanders can be grouped into two main categories: (1) breeding migration; and (2) interpond dispersal. Breeding migration is the movement of salamanders to and from a pond from the surrounding upland habitat. After metamorphosis, juveniles move away from breeding ponds into the surrounding uplands, where they live continuously for several years. At a study in Monterey County, it was found that upon reaching sexual maturity, most individuals returned to their natal/ birth pond to breed, while 20 percent dispersed to other ponds (Trenham *et al.* 2001). After breeding, adult California tiger salamanders return to upland habitats, where they may live for one or more years before attempting to breed again (Trenham *et al.* 2000).

California tiger salamanders are known to travel long distances between breeding ponds and their upland refugia. Generally it is difficult to establish the maximum distances traveled by any species, but salamanders in Santa Barbara County have been recorded dispersing up to 1.3 miles

from their breeding ponds (Sweet 1998). As a result of a 5-year capture and relocation study in Contra Costa County, Orloff (2011) estimated that captured California tiger salamanders were traveling a minimum of 0.5 miles to the nearest breeding pond and that some individuals were likely traveling more than 1.3 miles to and from breeding ponds. California tiger salamanders are also known to travel between breeding ponds. One study found that 20 to 25 percent of the individuals captured at one pond were recaptured later at other ponds approximately 1,900 and 2,200 feet away (Trenham *et al.* 2001). In addition to traveling long distances during juvenile dispersal and adult migration, salamanders may reside in burrows far from their associated breeding ponds.

Although previously cited information indicates that California tiger salamanders can travel long distances, they typically remain close to their associated breeding ponds. A trapping study conducted in Solano County during the winter of 2002/2003 suggested that juveniles dispersed and used upland habitats further from breeding ponds than adults (Trenham and Shaffer 2005). More juvenile California tiger salamanders were captured in traps placed at 328, 656, and 1,312 feet from a breeding pond instead of 164 feet. Approximately 20 percent of the captured juveniles were found at least 1,312 feet from the nearest breeding pond. The associated distribution curve suggested that 95 percent of juvenile California tiger salamanders were within 2,099 feet of the pond, with the remaining 5 percent being found at even greater distances. Preliminary results from the 2003-04 trapping efforts at the same study site detected juvenile California tiger salamanders at even further distances, with a large proportion of the captures at 2,297 feet from the breeding pond (Trenham 1998a). Surprisingly, most juveniles captured, even those at 2,100 feet, were still moving away from ponds. This data shows that many California tiger salamanders travel far while still in the juvenile stage. Post-breeding movements away from breeding ponds by adults appear to be much smaller. During post-breeding emigration from aquatic habitat, radio-equipped adult California tiger salamanders were tracked to burrows between 62 to 813 feet from their breeding ponds (Trenham 2001). These reduced movements may be due to adult California tiger salamanders exiting the ponds with depleted physical reserves, or drier weather conditions typically associated with the post-breeding upland migration period.

California tiger salamanders are also known to use several successive burrows at increasing distances from an associated breeding pond. Although previously cited studies provide information regarding linear movement from breeding ponds, upland habitat features appear to have some influence on movement. Trenham (2001) found that radio-tracked adults were more abundant in grasslands with scattered large oaks, than in more densely wooded areas. Based on radio-tracked adults, there is no indication that certain habitat types are favored as terrestrial movement corridors (Trenham 2001). In addition, captures of arriving adults and dispersing new metamorphs were evenly distributed around two ponds completely encircled by drift fences and pitfall traps. Thus, it appears that dispersal into the terrestrial habitat occurs randomly with respect to direction and habitat types.

Threats: The Central California tiger salamander is imperiled throughout its range due to a variety of human activities (Service 2004). Current factors associated with declining Central California tiger salamander populations include continued habitat loss and degradation due to

agriculture and urbanization; hybridization with the non-native eastern tiger salamander (*Ambystoma tigrinum*) (Fitzpatrick and Shaffer 2004; Riley *et al.* 2003); and predation by introduced species. Central California tiger salamander populations are likely threatened by multiple factors but continued habitat loss and fragmentation and colonization of non-native salamanders may represent the most significant current threats. Habitat isolation and fragmentation within many watersheds have precluded dispersal between sub-populations and threatened the viability of metapopulations (broadly defined as multiple subpopulations that occasionally exchange individuals through dispersal, and are capable of colonizing or "rescuing" extirpated habitat patches). Other threats include disease, predation, interspecific competition, exposure to contaminants, rodent and mosquito control, and road-crossing mortality. Currently, these various primary and secondary threats are largely not being offset by existing Federal, State, or local regulatory mechanisms. The Central California tiger salamander is also prone to chance environmental or demographic events, to which small populations are particularly vulnerable.

The Bay Area is located within the Central Coast and Livermore vernal pool regions (Keeler-Wolf *et al.* 1998). Most of the vernal pools in the Livermore Region in Alameda County have been destroyed or degraded by urban development, agriculture, water diversions, poor water quality, and long-term overgrazing (Keeler-Wolf *et al.* 1998). During the 1980s and 1990s, vernal pools were lost at a 1.1 percent annual rate in Alameda County (Holland 1998).

Due to the extensive losses of vernal pool complexes and their limited distribution in the Bay Area region, many Central California tiger salamander breeding sites consist of artificial water bodies. Overall, 82 percent (94) of the identified water bodies from the California Natural Diversity Database (CNDDB) Central California tiger salamander occurrences in Alameda County are stock, farm, or berm ponds used by cattle grazing and/or as a temporary water source for small farm irrigation (CDFG 2012). Without long-term maintenance (sediment removal, berm maintenance, etc.), the longevity of artificial breeding habitats is uncertain relative to naturally occurring vernal pools that are dependent on the continuation of seasonal weather patterns (Shaffer in litt. 2003).

Shaffer *et al.* (1993) found that the East Bay counties of Alameda and Contra Costa supported the greatest concentrations of Central California tiger salamander. Central California tiger salamander populations in the Livermore Valley are severely threatened by the ongoing conversion of grazing land to subdivisions and vineyards (Stebbins 2003). Central California tiger salamanders are under increasing pressure from habitat conversion and urbanization, development (i.e. Dublin Ranch, Fallon Village, Fallon Sports Park, Staples Ranch, and Shea Center Livermore, vineyards), and infrastructure, utility and safety improvement projects (i.e. I-580 Eastbound HOV, I-580/Isabel Avenue Interchange, and I-580/Charro Avenue Interchange). The species' low recruitment and high juvenile mortality makes it particularly susceptible to habitat loss, fragmentation, urbanization, and construction related harm and mortality.

California Tiger Salamander Critical Habitat

The Service designated critical habitat for the Central California tiger salamander on

August 23, 2005 (Service 2005c). The rule identifies approximately 199,109 acres in 19 counties in California.

Based on our current knowledge of the life history, biology, and ecology of the species and the relationship of its essential life history functions to its habitat, the Service determined that the Central population of the California tiger salamander requires the following PCEs: (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 California tiger salamanders depend upon for food, shelter, and protection from the elements and predation; and (3) accessible upland dispersal habitat between occupied locations that allow for movement between such sites. Refer to the final designation of critical habitat for additional information.

Alameda Whipsnake

Refer to the *Alameda Whipsnake (Masticophis lateralis euryxanthus) 5-Year Review: Summary and Evaluation* (Service 2011) for the current Status of the Species.

Alameda Whipsnake Critical Habitat

On October 2, 2006, the final rule determining critical habitat for the Alameda whipsnake was published in the **Federal Register** (Service 2006c). The rule identifies approximately 154,834 acres within six critical habitat units in Alameda, Contra Costa, Santa Clara, and San Joaquin counties, California.

Based on our current knowledge of the life history, biology, and ecology of the Alameda whipsnake and the requirements of the habitat necessary to sustain the essential life history functions of the subspecies, we have determined that the PCEs for the Alameda whipsnake are: (1) scrub/shrub communities with a mosaic of open and closed canopy: Scrub/shrub vegetation dominated by low-to medium-stature woody shrubs with a mosaic of open and closed canopy as characterized by the chamise, chamise-eastwood manzanita, chaparral whitethorn, and interior live oak shrub vegetation series (as identified in the Manual of California Vegetation (Sawyer and Keeler-Wolf 1995), A Guide to Wildlife Habitats of California (Mayer and Laudenslayer 1988), and California Wildlife Habitat Relationship System (CDFG 1998b)), occurring at elevations from sea level to approximately 3,850 feet. Such scrub/shrub vegetation within these series forms a pattern of open and closed canopy used by the Alameda whipsnake for shelter from predators; temperature regulation, because it provides sunny and shady locations; prey-viewing opportunities; and nesting habitat and substrate. These features contribute to support a prey base consisting of western fence lizards and other prey species such as skinks, frogs, snakes, and 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, California bay, California buckeye, and California annual grassland vegetation series (as identified in the Manual of California Vegetation (Sawyer and

Keeler-Wolf 1995), A Guide to Wildlife Habitats of California (Mayer and Laudenslayer 1988), and California Wildlife Habitat Relationship System (CDFG 1998b)) are PCE 2. This mosaic of vegetation is essential to the conservation of the Alameda whipsnake because it supports a prey base, consisting of western fence lizards and other prey species such as skinks, frogs, snakes, and birds. This provides opportunities for foraging by allowing snakes to come in contact with and visualize, track, and capture prey (especially western fence lizards along with other prey such as skinks, frogs, birds); short and long distance dispersal within, between, or to adjacent areas containing essential features (i.e., PCE 1 or PCE 3); and contact with other Alameda whipsnakes for mating and reproduction; and (3) lands containing rock outcrops, talus, and small mammal burrows within or adjacent to PCE 1 and or PCE 2. These areas are essential to the conservation of the Alameda whipsnake because they are used for retreats (shelter), hibernacula, foraging, and dispersal, and provide additional prey population support functions. Refer to the final designation of critical habitat for additional information.

San Joaquin Kit Fox

Refer to the San *Joaquin Kit Fox (Vulpes macrotis mutica) 5-Year Review: Summary and Evaluation* (Service 2010b) for the current Status of the Species.

Environmental Baseline

Callippe Silverspot Butterfly

Threats to callippe silverspot butterflies in the action area include illegal collection, habitat loss and degradation from human activities, including off-road vehicle use, trampling by hikers and horses, inappropriate levels of grazing, fire suppression, pesticide use, air pollution, and invasive exotic vegetation (Service 2009a).

The callippe silverspot butterfly is found exclusively within grassy hills surrounding San Francisco Bay that support its native host-plant, *Viola pedunculata* (California golden violet or Johnny jump-up) (Service 2009a). Populations within Alameda County have been observed; however, their taxonomic status as *S. c. callippe* has not been verified, according the 5-Year Review (Service 2009a). These include a population in the hills in the City of Pleasanton and a population along the watershed to the east of Calaveras Reservoir (just east of the city of Milpitas) (Arnold 2004a, b). Dr. Arnold noted that the individuals from the Calaveras reservoir population displayed morphological characteristics intermediate between the callippe silverspot butterfly and Comstock's silverspot butterfly (*S. c. comstocki*); however, Dr. Arnold judged this population was closer in appearance to the callippe silverspot butterfly (Arnold 2004a, b). Another population was identified with similar intermediate morphological characteristics in the proposed second phase of the Ohlone Preserve Conservation Bank.

The Service has determined it is reasonable to conclude the callippe silverspot butterfly inhabits the action area based on the recent observations of this species, the biology and ecology of the species, and the presence of suitable habitat.

California Red-Legged Frog

Loss of habitat due to increased development poses the biggest threat to California red-legged frog populations in Alameda County. Numerous recent developments have reduced habitat and known California red-legged frog populations: Schaefer Ranch in west Dublin; Dublin Ranch and other developments along Tassajara Road; Positano and Jordan Ranch developments within the East Dublin Specific Plan; and Las Positas College build out, business parks and vineyards in North Livermore. Other threats include off-road vehicle use and various forms of recreation, inappropriate levels of grazing, agriculture, flood control maintenance, herbicide and pesticide use, and by non-human activities such as predation by introduced species and/or feral animals (Service 2002a, 2010).

Alameda County is located within the Southeast San Francisco Bay Recovery Unit. This unit extends from the northernmost portion of Contra Costa County, includes a portion of San Joaquin County south to Santa Clara County, includes the eastern portion of San Mateo County, and all of San Francisco County. Within this Recovery Unit, red-legged frogs seem to have been nearly eliminated from the western lowland areas near urbanization, they still occur in isolated populations in the East Bay Foothills (between Interstate 580 and Interstate 680), and are abundant in several areas in the eastern portions of Alameda and Contra Costa Counties. This Recovery Unit is essential to the survival and recovery of the red-legged frog, as it contains the largest number of occupied drainages in the northern portion of its range (Service 2002a). Upper Alameda Creek (Sunol Regional Wilderness) and other creeks in Alameda County as well as the Coral Hollow Creek Watershed near the San Joaquin/Alameda County border support numerous occurrences (Service 2002a). The Recovery Plan established the following conservation needs for the East San Francisco Bay Core Area: (1) protect existing populations; (2) control non-native predators; (3) study effects of grazing on riparian corridors, ponds, and uplands (e.g., on EBRPD lands); (4) reduce impacts associated with livestock grazing; (5) protect habitat connectivity; (6) minimize effects of recreation and off-road vehicle use (e.g., Corral Hollow watershed); (7) avoid and reduce impacts of urbanization; and (8) protect habitat buffers from nearby urbanization (Service 2002a).

There are 123 occurrences of this species listed in the CNDDB within the Alameda County (CDFG 2012). Based on these occurrences, presence of suitable habitat, and the biology and ecology of the species, the Service has determined it is reasonable to conclude the California red-legged frog inhabits the action area.

California Red-Legged Frog Critical Habitat

The action area is within California red-legged frog critical habitat units ALA-1A, ALA-1B, and ALA-2. Subunit ALA-1A, Dublin Canyon, is comprised of approximately 3,650 acres of land and is located in northwestern Alameda County and southern Contra Costa County, north of Highway 580 and west of Dublin, California. Subunit ALA-1A consists of 603 acres of local government land and 3,047 acres of private land. Subunit ALA-1B, Cook Canyon, is comprised

of approximately 10,159 acres of land and is located in northwestern Alameda County, south of Highway 580. ALA-1B consists of 3,667 acres of local government land and 6,792 acres of private land. Subunit ALA-2, Arroyo Valle, is comprised of approximately 153,624 acres of land and is located in southwestern Alameda County, south of Highway 580 at Altamont Pass southeast into San Joaquin County and southwest into Santa Clara County near Arroyo Hondo and Calaveras Reservoir. The ALA-2 subunit consists of 6,892 acres of Federal, 3,932 acres of State, 39,525 acres of local government, and 103,276 acres of private lands.

Subunits ALA-1A, ALA-1B, and ALA-2 contain the features that are essential for the conservation of the species. These subunits contain aquatic habitat for breeding and non-breeding activities (PCE 1 and PCE 2), and upland habitat for foraging and dispersal activities (PCE 3 and PCE 4). These three subunits were all known to be occupied at the time of listing and are currently occupied. The subunits contain permanent and ephemeral aquatic habitats that provide for breeding that are comprised of manmade stock ponds and natural streams with emergent vegetation, willows, or are surrounded by riparian vegetation, grasslands and oak forest. These aquatic habitats also have adjacent upland areas for dispersal, shelter, and foraging opportunities. Subunits ALA-1A and ALA-1B provide for connectivity between populations farther south in the East San Francisco Bay foothills and represents the southernmost distribution of the California red-legged frogs and its habitat in the East San Francisco Bay region. The physical and biological features essential to the conservation of California red-legged frog in the all three subunits may require special management considerations or protection due to removal and alteration of habitat due to urbanization, alteration of aquatic and riparian habitats, dumping, and erosion and siltation of ponded habitat, which may alter aquatic or upland habitats and thereby result in the direct or indirect loss of egg masses or adults.

Central California Tiger Salamander

Threats to Central California tiger salamanders in the action area include habitat destruction, degradation, and fragmentation due to urban development and conversion to intensive agriculture, off-road vehicle use and various forms of recreation inappropriate levels of grazing, exposure to various contaminants, rodent population control efforts, mosquito control, hybridization with nonnative tiger salamanders and predation by introduced species and/or feral animals (Service 2004b). Numerous recent developments have reduced habitat and known Central California tiger salamander populations: Dublin Ranch and other developments along Tassajara Road; Positano and Jordan Ranch developments within the East Dublin Specific Plan; and Las Positas College build out, business parks, various road projects, and vineyards in North Livermore.

There are 123 occurrences within Alameda County (CDFG 2012). Based on these occurrences, presence of suitable habitat, and the biology and ecology of the species, the Service has determined it is reasonable to conclude the Central California tiger salamander inhabits the action area.

Central California Tiger Salamander Critical Habitat

The action area contains Central California tiger salamander critical habitat unit 18, Doolan Canyon Unit. This unit contains approximately 1,178 unprotected acres and is essential to the conservation of the species because it is needed to maintain the current geographic and ecological distribution of the species in the Central Valley Geographic Region. At the time of designation, two extant occurrences of the species were found in this unit. Unit 18 is south of the Contra Costa County line near Collier Canyon Road on the east and the south, and the City of Dublin on the west. Land ownership is private. Threats that require special management considerations for this unit include urban developments, agricultural land conversions, and associated infrastructure, including road construction which could destroy or degrade aquatic habitat essential for breeding and rearing; destroy, degrade, or fragment upland habitat essential for growth, feeding, resting, and aestivation; or destroy, degrade, or fragment habitat essential for dispersal and connectivity. Portions of Unit 18 are being proposed to be added to the City of Dublin's Sphere of Influence for development. At the same time, the City of Livermore is proposing to add the same lands to their Sphere of Influence for open space protection.

Alameda Whipsnake

Threats to Alameda whipsnakes in the action area include urban development and habitat loss and fragmentation, water development projects, predation, colonization of non-native plants species, inappropriate grazing, and off-road vehicle use and various forms of recreation (Service 2011). Current development pressure within and adjacent to this unit is primarily associated with the Cities of Pleasanton and Livermore along the northwestern border and the Cities of Fremont and Milpitas along the western border and various road projects.

Three recovery units occur entirely within the program area: the Hayward-Pleasanton Ridge and Sunol-Cedar Mountain populations and the Niles Canyon-Sunol corridor. Both the Hayward-Pleasanton-Ridge and Sunol-Cedar Mountain Recovery Units are presumed to contain extant populations on the basis of incidental sightings and limited surveys within portions of each unit since the 1970's (Service 2002b). Even though natural habitat exists in the Niles Canyon-Sunol corridor area, it is as yet unknown whether whipsnakes are able to use it. No surveys have been conducted there. The extreme southernmost boundary of the Mount Diablo-Black Hills Recovery Unit, which is also presumed to contain extant populations, is located within the northern edge of Alameda County.

There are 95 occurrences of this species contained with the CNDDB within Alameda County, primarily in the northern portion of the county (CDFG 2012). Based on these occurrences, presence of suitable habitat, and the biology and ecology of the species, the Service has determined it is reasonable to conclude the Alameda whipsnake inhabits the action area.

Alameda Whipsnake Critical Habitat

Alameda County contains three critical habitat units (AWS-3, AWS-5A, and AWS-5B) for a total of 53,260 acres. Approximately 13,722 acres are protected and 39,538 acres are

unprotected. Unit 3 is located immediately to the west of Interstate 680 and to the south of Interstate 580 and totals 25,966 acres. Land ownership includes 404 acres of EBRPD land and 25,562 acres of privately owned land. Unit 3 contains the mosaic of scrub and chaparral vegetation and rocky outcrops (PCE 1, PCE 3) considered essential to the conservation of the subspecies. The unit also includes variation in vegetation patch size, abundant edge between grassland and woodland, and a minimal amount of development or planned development. The area supports scrub and rock outcrop features essential for Alameda whipsnake. The Alameda whipsnake records within this unit are associated with Gaviota rocky sandy loams in particular, which likely provide talus (PCE 3), and appear to coincide in aerial imagery to scrub or chaparral vegetation preferred byAlameda whipsnake. Vegetation is largely of oak woodland community of variable densities (PCE 2) and statures (trees, shrubs) interspersed with grassland. Some peripheral portions of habitat around this unit were not included as critical habitat due to the high degree of development-related disturbance and fragmentation of the habitat. The unit is included in the designated critical habitat because it contains features essential to the conservation of the Alameda whipsnake; is currently occupied by the subspecies; and represents the southwestern portion of the subspecies' range and one of the five population centers. The special management actions that may be required throughout this unit include management of controlled burns and grazing, trespass, unauthorized trail and road construction, dumping, and/or feral animals, and other activities or situations associated with the urban or recreational interface.

Alameda whipsnake critical habitat unit AWS-5A, Cedar Mountain, is located east of Lake Del Valle along Cedar Mountain Ridge and Crane Ridge to Corral Hollow west of Interstate 580 and totals 24,723 acres. Land ownership within this unit includes approximately 2,492 acres of Department of Energy land, 246 acres of EBRPD land, and 21,986 acres are privately owned. The vegetation pattern within this unit consists of various woodland, scrub, and/or chaparral communities on northeast-facing slopes (PCE 1, PCE 2). Rock bearing soils which are associated with multiple Alameda whipsnake records (e.g. Vallecitos rocky loam) as well as rock lands are abundant, indicating the presence of PCE 3. Open, grassland-dominated communities are prominent on southwest-facing slopes, but there is also a significant component of woodland habitat on these slopes. Significant areas of vegetation types known to support Alameda whipsnake are present, including coastal oak, chamise-chaparral, mixed chaparral, blue-oak-foothill pine woodland, blue oak woodland, valley oak woodland, and montane hardwood. In most instances, the boundaries for critical habitat designation correspond to natural breaks in plant communities, habitat quality, and/or landform (ridgelines, water features). A moderate number of light duty roads (e.g., paved or unpaved lightly used) are present within the unit, although there are very few structures or other land modifications. Special management, such as prescribed burns, may be required for portions of the unit with dense vegetation. The special management actions that may be required throughout this unit include management of grazing, trespass, unauthorized trail and road construction, dumping, and/or feral animals, and other activities or situations associated with urban or recreational interface. The unit is included in designated critical habitat because it contains features essential to the conservation of the Alameda whipsnake, is currently occupied by the subspecies, and represents the southernmost and easternmost distribution of Alameda whipsnake and one of five population centers for the subspecies.

Alameda whipsnake critical habitat unit AWS-5B, Alameda Creek, is located northeast of Calaveras Reservoir, south of the town of Sunol, including the area along Wauhab Ridge in Alameda County and Oak Ridge in Santa Clara County and totals 18,214 acres. Land ownership within this unit includes approximately 361 acres of EBRPD lands and 17,854 acres in private lands. Vegetation is a mix of blue oak--foothill pine and annual grassland with a significant amount of woodland patches. Coastal live oak is present in the vicinity of Lleyden Creek. Soil types in which Alameda whipsnakes are found dominate the unit. This unit contains six Alameda whipsnake records documented between 1972 and 2000 (Swaim 2005a). Significant areas of vegetation types known to support Alameda whipsnake are present, including coastal oak, chamise-chaparral, mixed chaparral, blue oak-foothill pine woodland, blue oak woodland, valley oak woodland, and montane hardwood interspersed with rock outcrops or talus (PCEs 1, 2, 3).

The boundaries for critical habitat designation correspond to natural breaks in plant communities, soil type, and or landform. A moderate number of light roads are present within the unit, although there are very few structures or other land modifications. Development within or adjacent to the unit is minimal. As a result of this low development pressure, the survey efforts for the Alameda whipsnake in this unit have not been as extensive as in the other units. Special management, such as prescribed burns, may be required for portions of the unit with dense vegetation. Other special management actions which may be required throughout this unit includes management of grazing, unauthorized trail and road construction, dumping, and/or feral animals, control and other activities or situations associated with urban or recreational interface. The unit is included in designated critical habitat because it contains features essential to the conservation of the Alameda whipsnake, is currently occupied, and represents the southernmost distribution of Alameda whipsnake and one of the five population centers for the subspecies.

San Joaquin Kit Fox

Threats to San Joaquin kit foxes in the action area include loss and modification of habitat due to agricultural conversion, infrastructure construction, and urban development, pesticides and rodenticides, road mortality and off-road vehicle use, competition, and predation (Service 1998, 2010b). Numerous developments and activities have reduced and/or fragmented habitat for the San Joaquin kit fox within Alameda County: Dublin Ranch and other developments along Tassajara Road; Positano and Jordan Ranch developments within the East Dublin Specific Plan; and Las Positas College build out, business parks and vineyards in North Livermore, commercial and private racetracks and off-road vehicle parks, energy and water infrastructure projects, and agricultural conversion.

Portions of Alameda County are located within the San Joaquin kit fox recovery satellite population S1. In addition to protection of core areas, protection of at least three satellite populations is required for downlisting and protection of additional satellite populations with three or more showing stable or increasing populations during one precipitation cycle is required for delisting. According to the recent 5-year review (Service 2010b) the trend for the S1 population has declined with no known breeding. The Recovery Plan (Service 1998) lists protecting habitat in the northern, northeastern, and northwestern segments of the range and existing connections between habitat in those areas and habitat south as a recovery action.

There is one occurrence of San Joaquin kit fox within Alameda County listed in the CNDDB (CDFG 2012). There are 16 occurrences in close proximity in Contra Costa County (CDFG 2012). Based on these occurrences, presence of suitable habitat, and the biology and ecology of the species, the Service has determined it is reasonable to conclude the San Joaquin kit fox inhabits the action area.

Effects of the Proposed Action

The NRCS actions would control erosion, reduce sedimentation, restore native vegetation, restore pond habitat, improve the quality of riparian and upland habitat, resulting in net environmental benefits to listed species as well as non-listed native species. Many of these actions would benefit listed species and their habitat in the long-term. The improvements to riparian habitats and water quality would benefit listed species that utilize riparian corridors for breeding, foraging, or dispersal. Upland species and aquatic species that use upland habitats may be favored by better livestock distribution through spring development and control of overland runoff. Listed species will benefit from the removal of non-native or invasive vegetation in aquatic and upland habitat. Removal of non-native vegetation will result in the decreased spread of these species and less competition between non-native invasive species and native plants. Pond restoration activities will include removal of sediment and removal of aquatic vegetation. These activities may benefit California red-legged frogs and California tiger salamanders by providing more open water habitat and increasing the length of ponding. Many livestock ponds within Alameda County that otherwise may have silted in and become unsuitable breeding habitat can be maintained to ensure that they remain suitable habitat for these species.

Although the actions proposed by NRCS would result in net environmental benefits to listed species as well as non-listed native species, project implementation could also result in short-term adverse effects to listed species, such as disturbance from noise and vibrations from heavy equipment. Other adverse effects could result from permanent destruction of habitat (e.g., crushing of burrows utilized by California tiger salamanders) and temporary habitat destruction (e.g., temporary dewatering of creeks could affect dispersal and foraging of California red-legged frogs). However, avoidance and minimization measures have been incorporated into the Project Description of this Programmatic Biological Opinion that will significantly reduce potential adverse effects to listed species. A more detailed discussion of potential beneficial and adverse effects for each species covered under this programmatic consultation follows.

Callippe Silverspot Butterfly

Project effects to the Callippe silverspot butterfly and its habitat are likely to be beneficial or neutral. NRCS practices such as livestock water systems can help improve grazing distribution. Proper grazing distribution and management can improve habitat conditions for the *Viola pedunculata*, the larvae foodplant for the callippe silverspot butterfly. However, incidental take of callippe silverspot buttefly and its habitat could occur as a result of construction equipment and operation of projects. Use of heavy construction equipment in or near upland areas may harass, injure or kill callippe silverspot butterfly and its larvae foodplant by crushing or burying them. The noise and vibration of construction may also harass the species. Avoidance and

minimization measures will reduce adverse effects to the species. Avoidance and minimization measures include: avoidance of larval food plants; restriction of fertilizer or herbicide use within 300-feet of larval food plants; use of biological monitors; pre-construction surveys; environmental awareness training; and NRCS shall ensure that invasive, exotic plants will not be intentionally introduced during implementation of their projects.

California Red-Legged Frog and Central California Tiger Salamander

Many projects implemented by the NRCS in Alameda County directly benefit the California red-legged frog and Central California tiger salamander by restoring breeding habitat in the form of stock ponds, improving riparian areas that the species' may use, and improving upland habitat through assisting land managers with grazing management and livestock distribution. However, incidental take of California red-legged frog and Central California tiger salamander could occur as a result of construction and operation of projects. Use of heavy construction equipment in or near pond areas during project activities may harass, injure, or kill the California red-legged frog and Central California tiger salamander by crushing or burying them. The noise and vibration of construction may harass these species and continuing maintenance at the project site, such as planting of desirable plants and control of undesirable plants through mechanical or manual removal or herbicide application, may harass, harm, injure, or kill the California red-legged frog and California tiger salamander. Temporary dewatering of creeks, ponds, or wetlands may harm or kill California red-legged frog and Central California tiger salamander adults, larvae and eggs if they are not translocated to suitable habitat. Capture and translocation of California red-legged frogs and Central California tiger salamanders may also harm, injure, or kill these species from the stress of handling and transportation. California red-legged frogs and Central California tiger salamanders that move or are translocated away from a construction area may move away from shelter and be more susceptible to injury and mortality from predation and vehicular or foot traffic. Displaced California red-legged frogs and Central California tiger salamanders may experience increased competition from animals in adjacent areas. Avoidance and minimization measures will be utilized to reduce potential adverse effects to the California red-legged frog and Central California tiger salamanders. These measures include use of work windows to avoid times when ponds may have red-legged frog tadpoles and Central California tiger salamander larvae (work will occur August 31 to October 31); use of biological monitors; avoidance of areas with high numbers of small mammal burrows; pre-construction surveys; environmental awareness training; covering all holes and trenches deeper than 6 inches at the end of each day; and use of BMPs to reduce soil erosion into streams. In addition, all handling of California red-legged frogs or Central California tiger salamanders will be by a Service-approved biologist.

Alameda Whipsnake

Project effects to Alameda whipsnake and its habitat are likely to be beneficial or neutral. Installation of livestock water systems can improve grazing management, resulting in reduced weeds species and improved habitat for the Alameda whipsnake. Improve grazing practices can also reduce fuel loads, reducing the chances of catastrophic wildfires, a threat to Alameda Whipsnake habitat. Incidental take of Alameda whipsnake could occur as a result of heavy construction equipment and project construction. Use of heavy construction equipment in or

near upland areas may harass, injure or kill Alameda whipsnake. The species may be run over, buried or crushed by equipment moving on roads and trails to and from the project site. The noise and vibration of construction may also harass the species. Avoidance and minimization measures will be utilized to reduce potential adverse effects to Alameda whipsnake. These measures include: avoidance of all rock outcrops; use of a work window during the active season of the Alameda whipsnake (June 15 to October 31); use of a biological monitor; environmental awareness training; pre-construction surveys; covering all holes and trenches deeper than 6 inches at the end of each day; and restriction from using plastic mono-filament erosion control matting.

San Joaquin Kit Fox

Project effects to the San Joaquin kit fox and its habitat are likely to be neutral; however, some adverse effects could occur, such as harassment from noise and vibration from construction equipment. Because of the avoidance measures that NRCS will implement and the rarity of the species in Alameda County, it is unlikely that construction activities will wound or kill San Joaquin kit fox. Avoidance measures include: pre-construction surveys; use of a biological monitor; environmental awareness training; inspections of all pipes left overnight to ensure that kit foxes are not inside the pipes prior to burying or transporting the pipes; covering all holes and trenches deeper than 6 inches at the end of each day; and proper disposal of all trash and debris at the worksite.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The global average temperature has risen by approximately 0.6 degrees Celsius during the 20th Century (Intergovernmental Panel on Climate Change 2001, 2007; Adger *et al* 2007). There is an international scientific consensus that most of the warming observed has been caused by human activities (Intergovernmental Panel on Climate Change 2001, 2007; Adger *et al.* 2007), and that it is "very likely" that it is largely due to manmade emissions of carbon dioxide and other greenhouse gases (Adger *et al.* 2007). Ongoing climate change (Inkley *et al.* 2004; Kerr 2007; Adger *et al.* 2007; Kanter 2007) likely imperils these listed species and the resources necessary for their survival. Since climate change threatens to disrupt annual weather patterns, it may result in a loss of their habitat and/or prey, and/or increased numbers of their predators, parasites, and diseases. Where populations are isolated, a changing climate may result in local extinction, with range shifts precluded by lack of habitat.

Conclusion

After reviewing the current status of the species, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological

opinion that projects which meet the qualifications for this Programmatic Biological Opinion are not likely to jeopardize the continued existence of the callippe silverspot butterfly, California red-legged frog, Central California tiger salamander, Alameda whipsnake, or San Joaquin kit fox. Although critical habitat for the California red-legged frog, Central California tiger salamander, and Alameda whipsnake will be affected, none will be destroyed or adversely modified by the projects that meet the qualifications of the Programmatic Biological Opinion. The NRCS projects will have overall beneficial effects to these species and their aquatic and upland habitat. Though some permanent and temporary habitat loss may occur for some listed species, the overall benefits of the NRCS projects, such as riparian habitat restoration, decreased sedimentation into creeks and streams, pond restoration, and non-native/invasive species removal, will offset the temporary and permanent loss of habitat. Protective measures will be implemented that will ensure a minimal amount of habitat loss and disturbance to listed species. NRCS personnel may also serve to document previously unknown populations of listed plant and animal species which will help to further recovery efforts for these and other listed species.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information or data bases. The Service recommends the following actions:

1. The NRCS should continue to assist the Service in implementing recovery actions identified in the *Recovery Plan for the California Red-legged Frog* (Service 2002) and the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (Service 1998).

2. If a listed species is found on a project site, the Service recommends that NRCS collaborate with the landowner to identify and implement management activities or other measures that may benefit the species and sustain populations on the property.

3. The NRCS should apply the Wildlife Friendly Pond Habitat Program that it implements in cooperation with the Alameda County Resource Conservation District and apply it to other areas within the range of the California tiger salamander.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION - CLOSING STATEMENT

This concludes of formal consultation on the implementation of the NRCS's Conservation Practices in Alameda County. As provided in 50 CFR 402.16, reinitiating of formal consultation

is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must immediately cease, pending reinitiation.

If you have any questions regarding this biological opinion, please contact Kim Squires, Senior Endangered Species Biologist, Rick Kuyper, Private Lands Biologist, or Ryan Olah, Coast Bay/Forest Foothills Division Chief, at the letterhead address, telephone (916) 414-6600, or electronic mail at Kim_Squires@fws.gov, Richard_Kuyper@fws.gov, or Ryan_Olah@fws.gov.

Sincerely,

Susan K. Moore
Field Supervisor

cc:
Tom Moore, State Biologist, NRCS State Office, Davis, California
Jackie Charbonneau, Ecologist, NRCS Livermore Local Partnership Office, Livermore, California

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