United States Department of the Interior

FISH AND WILDLIFE SERVICE
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In Reply Refer to:
08ESMF00-
2016-F-0874

Chief Regulatory Division
Attention: Justin Yee
U.S. Army Corps of Engineers
1455 Market Street 16th Floor
San Francisco, California 94103-1398

JUL 07 2016

Subject: Programmatic Formal Endangered Species Consultation on the Regional General Permit for California Department of Fish and Wildlife Anadromous Fisheries Restoration Grant Program (Corps Regional General Permit 12; File no. 2003-279220)

Dear Aaron O. Allen Ph. D:

This letter is in response to the U.S. Army Corps of Engineers (Corps), November 20, 2015 request for initiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed California Department of Fish and Wildlife (CDFW) Fisheries Restoration Grant Program (Program) in Alameda, Contra Costa, Lake, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties, California. Your request was received by the Service on November 23, 2015. At issue are the proposed project's effects on federally endangered and threatened species and their critical habitat (Table 1). This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR 402).

Table 1

Species	Listed Status
Amphibians	
California red-legged frog (*Rana draytonii*)	Federally Threatened
California red-legged frog Critical Habitat	
California Tiger Salamander (*Ambystoma californiense*) Sonoma County Distinct Population Segment (DPS)	Federally Endangered
California Tiger Salamander Sonoma County DPS Critical Habitat	
California Tiger Salamander Central California DPS	Federally Threatened
California Tiger Salamander Central California DPS Critical Habitat	
Birds	
Least Bell's vireo (*Vireo bellii pusillus*)	Federally Endangered
Marbled Murrelet (*Brachyramphus marmoratus*)	Federally Threatened
Marbled Murrelet Critical Habitat	
Northern Spotted Owl (*Strix occidentalis caurina*)	Federally Threatened
Northern Spotted Owl Critical Habitat	
Southwestern willow flycatcher (*Empidonax traillii extimus*)	Federally Endangered
Fish	

Tidewater goby (*Eucyclogobius newberryi*)	Federally Endangered
Tidewater goby Critical Habitat	
Invertebrates	
California freshwater shrimp (*Syncaris pacifica*)	Federally Endangered
Reptiles	
San Francisco garter snake (*Thamnophis sirtalis tetratenia*)	Federally Endangered

The federal action on which we are consulting is the issuance of a Clean Water Act Section 404 permit to CDFW for the Fisheries Restoration Grant Program. Pursuant to 50 CFR 402.12(j), you submitted a biological assessment and supplement for our review and requested concurrence with the findings presented therein.

In considering your request, we based our evaluation on the following: (1) The November 20 2015, Corps request for consultation; (2) the 2015 Mitigated Negative Declaration for the Fisheries Restoration Grant Program; (3) the 2010 California Salmonid Stream Habitat Restoration Manual; (4) numerous emails from Fish and Game to the Service; (5) a February 17, 2016 meeting with the Corps and CDFW to discuss implementation of the Program; and (6) other information available to the Service.

In your letter dated November 20, 2015, you requested our concurrence that the proposed authorization is not likely to adversely affect the California red-legged frog or its critical habitat, Sonoma County DPS and threatened Central California DPS of the California tiger salamander, least Bell's vireo, marbled murrelet, northern spotted owl, southwestern willow flycatcher, tidewater goby and California freshwater shrimp. San Francisco garter snake was not initially included in the determination as previously all San Francisco garter snake required independent consultation; however, with the revised approach it was agreed by the Service, Corps and CDFW would be able to include San Francisco garter snake. You reached this conclusion based on the proposed implementation of several measures intended to avoid effects to these species from project activities.

We concur with your determination that the proposed authorization may affect, but is not likely to adversely affect, critical habitat for the California red-legged frog. Our concurrence is based on the following factors:

1. Projects implemented under the proposed authorization will not damage or deteriorate any of the primary constituent elements (aquatic breeding habitat, aquatic non-breeding habitat, upland habitat, and dispersal habitat) of critical habitat as defined in the revised designation (74 FR 51829);

2. Restoration projects implemented under the proposed authorization within critical habitat units will likely improve the quality of California red-legged frog habitat in these areas. This will improve the function and productivity of the critical habitat units for red-legged frogs; and

3. Restoration projects implemented under the proposed authorization will revitalize degraded or impaired aquatic and riparian habitats. This will provide a long-term benefit to California red-legged frog, and result in higher quality habitat in dispersal corridors and core areas.

We concur with your determination that the proposed authorization may affect, but is not likely to adversely affect, the Sonoma County and Central California DPS of the California tiger salamander and their critical habitat. Our concurrence is based on the following factors:

1. Most of the proposed projects will occur in or near streams and riparian corridors;

2. Upslope projects will be limited to road upgrading and decommissioning in areas that are steep, eroding, and often vegetated with trees and shrubs; and

3. California tiger salamanders use ponds and vernal pools for breeding, and existing burrows in grassland habitat refuge. Neither of these habitat types is usually located in proximity to anadromous fish-bearing streams;

4. Projects implemented under the proposed authorization will not damage or deteriorate any of the primary constituent elements (aquatic breeding habitat, upland habitat that contain small mammal burrows or other underground habitat, and dispersal habitat between occupied locations) of critical habitat as defined in the revised designation (70 FR 49380, 76 FR 54386).

We concur with your determination that the proposed authorization may affect, but is not likely to adversely affect, the least Bell's vireo. Our concurrence is based on the following factors:

1. Protocol surveys for least Bell's vireo will be conducted at proposed project sites by a qualified biologist knowledgeable in least Bell's vireo identification and biology;

2. Work will not begin within 0.25 mile of any site with known or potential least Bell's vireo habitat until after September 15; and

3. Willow branches will not be harvested at any site with potential least Bell's vireo habitat between March 1 and September 15.

We concur with your determination that the proposed authorization may affect, but is not likely to adversely affect, the marbled murrelet and northern spotted owl or their critical habitat. Our concurrence is based on the following factors:

1. Qualified biologists will conduct protocol surveys for spotted owls and marbled murrelets at proposed project sites which contain potential habitat;

2. Work will not be conducted within 0.25 mile of any site with known or potential marbled murrelet habitat between November 1 and September 15, or known or potential spotted owl habitat between November 1 and July 31. If protocol surveys determine that nesting spotted owls or marbled murrelets do not occur within 0.25 mile of a specific project site, project activities at that site may commence prior to September 15; and

3. Project activities will not remove or degrade suitable spotted owl or marbled murrelet habitat or their critical habitat.

We concur with your determination that the proposed authorization may affect, but is not likely to adversely affect, the southwestern willow flycatcher. Our concurrence is based on the following factors:

1. All projects within the counties described in this Biological Opinion are outside of the breeding range of southwestern willow flycatcher.

We concur with your determination that the proposed authorization may affect, but is not likely to adversely affect, the Tidewater Goby or its critical habitat. Our concurrence is based on the following factors:

1. No work will be conducted in lagoon habitats or done in a manner than will indirectly adversely affect lagoon habitat.

We do not concur with your determination that the proposed authorization may affect, but is not likely to adversely affect, California red-legged frog and California freshwater shrimp. We believe that the proposed authorization may adversely affect these species. Factors contributing to this determination are the proposed relocation of California freshwater shrimp and California red-legged frogs from project areas and use of heavy equipment in or near shrimp or red-legged frog habitat. The Service believes that these activities may adversely affect them and thereby warrant formal consultation.

The remainder of this document provides our biological opinion on the effects of the proposed project on California red-legged frog, California freshwater shrimp, and San Francisco garter snake.

Consultation History

Date:	Description
November 20, 2015	The Service received a request from the Corps for formal consultation and renewal of the Program.
December 7, 2015	The Service contacted the Corps and requested additional information and informed the Corps the Service would be writing a new Programmatic Biological Opinion as the project had changed significantly from previous iterations.
February 17, 2016	The Service, Corps, and CDFW met to discuss a change in approach requiring project level appendages and coverage of additional species as well as the need for revised mitigation and minimization measures.
March – April, 2016	The Service , CDFW, and Corps exchanged emails to clarify the Description of the Action and the Corps determinations.

Description of the Action

Introduction

The Corps proposes to renew Regional General Permit (RGP) 12 authorizing the CDFW to fund and carry out various salmonid habitat enhancement and restoration. The RGP will have a term of 5 years from the date of authorization. Program activities are proposed annually for various watersheds throughout Alameda, Contra Costa, Del Norte, Glenn, Humboldt, Lake, Marin, Mendocino, Monterey, Napa, San Benito, San Francisco, San Luis Obispo, San Mateo, Santa Clara, Santa Cruz, Siskiyou, Solano, Sonoma, Trinity, and Ventura counties. The Corps' proposed authorization addressed by this consultation will apply only to Program projects in counties within the regulatory jurisdictional boundaries of the Corps' San Francisco District. Of the resulting geographic area, the Sacramento Fish and Wildlife Office has regulatory purview only over Alameda, Contra Costa, Lake, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties. Therefore, this consultation pertains only to Program projects utilizing the proposed authorization that are executed in Alameda, Contra Costa, Lake, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties.

Administration of this Programmatic Biological Opinion

This programmatic consultation will be implemented upon determination by the Corps that a proposed project that qualifies for authorization under Corps RGP 12 or otherwise meets the suitability criteria set forth in this document as required by the implementing regulations for section 7 of the Act. The Corps will provide the Service with all of the written documentation utilized to formulate its determination. Upon receipt of the appropriate information, the Service will review the material and evaluate whether it is appropriate to append the project to this programmatic biological opinion based on the level of effects, and the avoidance, minimization and compensation measures proposed. The Service, upon review of information provided by the Corps, may determine some projects require separate Section 7 consultation and are not suitable append to this programmatic biological opinion. If the Service does not concur the project is appropriate to be appended to this programmatic biological opinion, the Service will notify the Corps in writing. If the Service does concur it is appropriate to append the project to this programmatic biological opinion and other listed species also will be adversely affected, the proposed action will be appended to this programmatic biological opinion and a biological opinion will be completed for the additional listed species. Both the appendage and the biological opinion will be combined into a single document by the Service that will be issued to the Corps.

The action area of this programmatic biological opinion overlaps with many other mechanisms that authorize incidental take of listed species such as Habitat Conservation Plans or other programmatic biological opinions. The applicant may seek incidental take authorization through one of these other mechanisms for projects that may affect the species, provided the sponsoring agency determines the applicant's project meets the criteria for inclusion under their respective mechanism, and subject to Service guidance and approval. At the Service's discretion, proposed actions that do not meet the suitability criteria may still be appended, if the complete implementation of appropriate additional conservation measures sufficiently reduces the effects of the action or that the project has minimal effects that are consistent with the intent of this programmatic biological opinion.

This programmatic biological opinion is effective for a period of 5 years from the date of its issuance and can be extended if deemed appropriate by both agencies The Service will review this

programmatic consultation, as appropriate, to ensure that its application is consistent with the intended criteria.

Requirements for Appendage to this Programmatic Biological Opinion

1. To be considered for appendage, projects are required to provide at minimum: a project description, action area, environmental baseline, California Natural Diversity Database (CNDDB) records within three miles of the project site, and an official species list (https://ecos.fws.gov/ipac/) for federally listed species. An example standard of information is included in Enclosure 1. The Service may request additional information.

2. Any federally listed species included in this programmatic biological opinion identified as potentially occurring within the action area will be addressed with the minimization measures provided in this Programmatic Biological Opinion. Modification or exclusion of minimization measures that do not reduce the likelihood of take of listed species is permitted with justification.

3. Any federally listed species not included in this programmatic biological opinion identified as potentially occurring within the action area will be addressed with additional avoidance and minimization measures as appropriate. For information and appropriate species specific conservation measures please contact the Coast Bay Division Chief at (916) 414-6623.

4. Any project within critical habitat of federally listed species within the action area will be addressed with all proposed avoidance and minimization measures.

5. The minimization measures provided are not intended to be exhaustive. Should additional measures be required to further reduce the likelihood of take of federally listed species then they will be included in each project's project description.

6. CDFW will provide post construction monitoring, reporting, and tracking on an annual basis.

7. Any encountered federally protected species will be reported to CNDDB and copies of the reporting forms be provided with each end of year report.

Covered Activities

All projects will be carried out in accordance with techniques identified in the California Salmonid Stream Habitat Restoration Manual (available online at www.dfg.ca.gov/fish/resources/habitatmanual.asp). The following descriptions of restoration treatments are summarized from the Restoration Manual; these descriptions are not intended to be exhaustive. For more detailed information on specific project methods the 2010 4th edition California Salmonid Stream Habitat Restoration Manual (Manual) is hereby incorporated by reference. Several Projects were further defined during NMFS consultation and by extension are also incorporated by reference (Enclosure 2). Additional activities deemed appropriate to be included within this programmatic biological opinion may be appended upon Service approval.

1. Electrofishing Surveys (Manual IV-12)

2. Instream Habitat Improvements (Manual VII-24, NMFS Guidance)

3. Fish Passage (Manual VII-47, IX-47, XII, NMFS Guidance)

4. Watershed and Stream Bank Stabilization (VII-62)

5. Upslope Erosion and Sediment Control Guidance (Manual X)

6. Riparian Habitat Restoration (Manual XI)

7. Water Conservation Measures (NMFS Guidance)

Conservation, Avoidance and Minimization Measures

Preconstruction Surveys

1. CDFW or their agent shall survey all work sites for rare plants prior to any ground disturbing activities. Rare plant surveys will be conducted following the "Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities" (CDFW, 2009).

2. If any special status plant species are identified at a work site, CDFW will require one or more of the following protective measures to be implemented before work can proceed:

    a. Fencing to prevent accidental disturbance of rare plants during construction,

    b. On-site monitoring by a Service approved monitor during construction to assure that rare plants are not disturbed, and

    c. Redesign of proposed work to avoid disturbance of rare plants.

3. Plant surveys will also include any host plants for butterflies identified as occurring in the area either in the CNDDB or the official species list. These host plants are included in Enclosure 3. If any host plant species are identified at a work site, CDFW shall require one or more of the following protective measures to be implemented before work can proceed:

    a. Fencing to prevent accidental disturbance of larval host plants during construction,

    b. On-site monitoring by a qualified biologist during construction to assure that larval host plants are not disturbed, and

    c. Redesign of proposed work to avoid disturbance of larval host plants.

4. If it becomes impossible to implement the project at a work site without impacts to larval host plants, then activity at that work site shall not proceed.

5. CDFW will ensure that the grantee or responsible party is aware of these site-specific conditions, and shall inspect the work site before, during, and after completion of the habitat restoration action.

General Measures for Protection of Biological Resources

1. A copy of the programmatic biological opinion, its appendage, and the applicable project enclosures will be kept on site. If the documents are stored electronically, then local versions must be saved on site, and not require network connection to access them.

2. Projects will be timed to avoid impacts to aquatic habitat. The activities carried out in the restoration program typically occur during the summer dry season where flows are low or streams are dry.

    a. Work around streams is restricted to the period of June 15 through November 1 or the first significant rainfall, whichever comes first.

    b. To the extent feasible, upslope work period will be restricted to periods that will minimize effects to federally listed species. Work outside these periods will require Service approval.

    c. The approved work window for individual work sites will be further constrained as necessary to avoid the nesting of birds.

        i. At sites with potential for raptor (including northern spotted owls) and migratory bird nesting, if work is conditioned to start after July 9, potential impacts will be avoided and no surveys will be required.

        ii. At sites that might contain nesting marbled murrelets, the starting date will be September 16 in the absence of surveys. The work window at individual work sites could be advanced if surveys determine that nesting birds will not be impacted.

    d. For restoration work that may affect swallow nesting habitat (such as removal or modification of bridges, culverts or other structures that show evidence of past swallow nesting activities), construction shall occur after August 31 to avoid the swallow nesting period. Suitable nesting habitat shall be netted prior to the breeding season to prevent nesting. Netting shall be installed before any nesting activity begins, generally prior to March 1. Swallows shall be excluded from areas where construction activities cause nest damage or abandonment.

    e. All project activities shall be confined to daylight hours.

3. Projects shall not disturb or dewater more than 500 feet of contiguous stream reach.

4. During all activities at project work sites, all trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris shall be removed from work areas.

5. Staging/storage areas for equipment, materials, fuels, lubricants, and solvents, will be located outside of the stream's high water channel and associated riparian area where it cannot enter the stream channel. Stationary equipment such as motors, pumps, generators, compressors, and welders located within the dry portion of the stream channel or adjacent to the stream, will be positioned over drip-pans. Vehicles will be moved out of the normal high water area of the stream prior to refueling and lubricating. The grantee shall ensure that contamination of habitat does not occur during such operations. Prior to the onset of work, CDFW shall ensure that the grantee has prepared a plan to allow a prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

6. The number of access routes, number and size of staging areas, and the total area of the work site activity shall be limited to the minimum necessary to complete the restoration action while minimizing riparian disturbance without affecting less stable areas, which may increase the risk of channel instability. Existing roads shall be used to access work sites as much as practicable. These access roads will be clearly identified in the project description.

7. The access and work area limits shall be identified with brightly colored flagging or fencing. Flagging and fencing shall be maintained in good repair for the duration of project activities. All areas beyond the identified work area limits shall not be disturbed.

8. Any construction debris shall be prevented from falling into the stream channel. Any material that does fall into a stream during construction shall be immediately removed in a manner that has minimal impact to the streambed and water quality.

9. Where feasible, the construction shall occur from the bank, or on a temporary pad underlain with filter fabric.

10. Any work within the stream channel shall be performed in isolation from the flowing stream and erosion protection measures shall be in place before work begins.

    a. Prior to dewatering, the best means to bypass flow through the work area to minimize disturbance to the channel and avoid direct mortality of fish and other aquatic invertebrates shall be determined.

    b. If there is any flow when work will be done, the grantee shall construct coffer dams upstream and downstream of the excavation site and divert all flow from upstream of the upstream dam to downstream of the downstream dam.

    c. No heavy equipment shall operate in the live stream, except as may be necessary to construct coffer dams to divert stream flow and isolate the work site.

    d. Coffer dams may be constructed with clean river run gravel or sand bags, and may be sealed with sheet plastic. Upon project completion, sand bags and any sheet plastic shall be removed from the stream. Clean river run gravel may be left in the stream channel, provided it does not impede stream flow or fish passage, and conforms to natural channel morphology without significant disturbance to natural substrate.

e. Dewatering shall be coordinated with a qualified fisheries biologist to perform fish and wildlife relocation activities.

f. The length of the dewatered stream channel and the duration of the dewatering shall be kept to a minimum.

g. When bypassing stream flow around work area, stream flow below the construction site shall be maintained similar to the unimpeded flow at all times.

h. The work area shall be periodically pumped dry of seepage. Pumps shall be placed in flat areas, away from the stream channel. Pumps shall be secured by tying off to a tree or staked in place to prevent movement by vibration. Pump intakes shall be covered with 0.125 inch mesh to prevent entrainment of fish or amphibians that failed to be removed. Pump intakes shall be periodically checked for impingement of fish or amphibians, and shall be relocated according to the approved measured outlined for each species bellow.

i. If necessary, flow shall be diverted around the work site, either by pump or by gravity flow, the suction end of the intake pipe shall be fitted with fish screens meeting CDFW and NMFS criteria to prevent entrainment or impingement of small fish. Any turbid water pumped from the work site itself to maintain it in a dewatered state shall be disposed of in an upland location where it will not drain directly into any stream channel.

j. Fish shall be excluded from the work area by blocking the stream channel above and below the work area with fine-meshed net or screen. Mesh shall be no greater than 1/8-inch diameter. The bottom edge of the net or screen shall be completely secured to the channel bed to prevent fish from reentering the work area. Exclusion screening shall be placed in areas of low water velocity to minimize fish impingement. Screens shall be regularly checked and cleaned of debris to permit free flow of water.

11. Where the disturbance to construct coffer dams to isolate the work site would be greater than to complete the action (for example, placement of a single boulder cluster), the action shall be carried out without dewatering and fish relocation. Furthermore, measures shall be put in place immediately downstream of the work site to capture suspended sediment. This may include installation of silt catchment fences across the stream, or placement of a filter berm of clean river gravel. Silt fences and other non-native materials will be removed from the stream following completion of the activity. Gravel berms may be left in the stream channel provided it does not impede stream flow or fish passage, and conforms to natural channel morphology without significant disturbance to natural substrate.

12. Best management practices associated with fish screens and measures to minimize effects to salmonids associated with fish screen construction, maintenance, and repair are presented below:

a. Screening projects shall only take place on diversions with a capacity of 60 cfs or less. Screening larger diversions shall require separate consultation. Fish screens shall be operated and maintained in compliance with current law, including Fish and

Game Code, and CDFW fish screening criteria. CDFW screening criteria may be referenced on the Internet at: http://www.dfg.ca.gov/fish/Resources/Projects/Engin/Engin_ScreenCriteria.asp.

b. Notwithstanding Fish and Game Code section 6027, fish screens and bypass pipes or channels shall be in-place and maintained in working order at all times water is being diverted.

c. If a screen site is dewatered for repairs or maintenance when targeted fish species are likely to be present, measures shall be taken to minimize harm and mortality to targeted species resulting from fish relocation and dewatering activities. The responsible party shall notify CDFW before the project site is de-watered and streamflow diverted. The notification shall provide a reasonable time for personnel to supervise the implementation of a water diversion plan and oversee the safe removal and relocation of salmonids and other fish life from the project area. If the project requires site dewatering and fish relocation, the responsible party shall implement the dewatering and relocation measures as described in this document to minimize harm and mortality to listed species.

d. If a fish screen is removed for cleaning or repair, measures shall be undertaken to ensure juvenile fish are not passively entrained into the diversion canal. The area shall be isolated, cleared of fish, and dewatered prior to screen maintenance or replacement. If dewatering the work area is infeasible, then the area in front of the screen shall be cleared of fish utilizing a seine net that remains in place until the project is complete. In the case of a damaged screen, a replacement screen shall be installed immediately or the diversion shut down until a screen is in place.

e. Fish screens shall be inspected and maintained regularly (not less than two times per week) to ensure that they are functioning as designed and meeting CDFW fish screening criteria. During the diversion season, screens shall be visually inspected while in operation to ensure they are performing properly. Outside the diversion season when the screening structure is dewatered, the screen and associated diversion structure shall be more thoroughly evaluated.

f. Existing roads shall be used to access screen sites with vehicles and/or equipment whenever possible. If it is necessary to create access to a screen site for repairs or maintenance, access points shall be identified at stable stream bank locations that minimize riparian disturbance.

g. Sediment and debris removal at a screen site shall take place as often as needed to ensure that screening criteria are met. Sediment and debris shall be removed and disposed at a location where it will not re-enter the water course.

h. Stationary equipment used in performing screen maintenance and repairs, such as motors, pumps, generators, and welders, located within or adjacent to a stream shall be positioned over drip pans.

i. Equipment which is used to maintain and/or repair fish screens shall be in good condition and checked and maintained on a daily basis to prevent leaks of materials that could be deleterious to aquatic life, wildlife, or riparian habitat.

j. To the extent possible repairs to a fish screen or screen site shall be made during a period of time when the target species of fish are not likely to be present (for example, in a seasonal creek, repair work should be performed when the stream is dry).

k. Equipment used to maintain and/or repair fish screens shall not operate in a flowing stream except as may be necessary to construct coffer dams to divert stream flow and isolate the work site.

l. Turbid water which is generated by screen maintenance or repair activities shall be discharged to an area where it will not re-enter the stream. If the CDFW determines that turbidity/siltation levels resulting from screen maintenance or repair activities constitute a threat to aquatic life, all activities associated with the turbidity/siltation shall cease until effective CDFW-approved sediment control devices are installed and/or abatement procedures are implemented.

13. Any equipment entering the active stream (for example, in the process of installing a coffer dam) shall be preceded by an individual on foot to displace wildlife and prevent them from being crushed.

14. If any non-special status wildlife are encountered during the course of construction, said wildlife shall be allowed to leave the construction area unharmed, and shall be flushed, hazed, or herded in a safe direction away from the project site. "Special status wildlife" is defined as any species that meets the definition of "endangered, rare, or threatened species" in section 15380, article 20 in Title 14 of the California Code of Regulations, also known as the "CEQA Guidelines".

15. Any red tree vole nests encountered at a work site shall be flagged and avoided during construction.

16. For any work sites containing western pond turtles, salamander, foothill yellow- legged frogs, or tailed frogs, the grantee shall provide to the CDFW grant manager for review and approval, a list of the exclusion measures that will be used at their work site to prevent take or injury to any individual pond turtles, salamanders, or frogs that could occur on the site. The grantee shall ensure that the approved exclusion measures are in place prior to construction. Any turtles or frogs found within the exclusion zone shall be moved to a safe location upstream or downstream of the work site, prior to construction.

17. All habitat improvements shall be done in accordance with techniques in the California Salmonid Stream Habitat Restoration Manual.

18. The grantee shall have dependable radio or phone communication on-site to be able to report any accidents or fire that might occur.

19. Installation of bridges, culverts, or other structures shall be done so that water flow is not impaired and upstream and downstream passage of fish is assured at all times. Bottoms of temporary culverts shall be placed at or below stream channel grade.

20. Temporary fill shall be removed in its entirety prior to close of work-window.

California Red-legged Frog

1. Project activities in potential red-legged frog habitat shall be restricted to the period between July 1 and October 15.

2. No electrofishing will be conducted in red-legged frog breeding habitat from November 1 – April 31.

3. At least 15 days prior to the onset of project activities, CDFW shall submit the names(s) and credentials of biologists who would implement the Programmatic Biological Opinion. No project activities shall begin until CDFW has received written approval from the Service that the biologist(s) is qualified to conduct the work.

4. Service approved biologist(s) who handle red-legged frogs shall ensure that their activities do not transmit diseases. To ensure that diseases are not conveyed between work sites by the Service-approved biologist, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force (http://www.fws.gov/ventura/docs/species/protocols/DAFTA.pdf) shall be followed at all times.

5. A CDFW monitoring plan shall be developed to determine the level of incidental take of the red-legged frog associated with the Restoration Program funded activities in the area. The monitoring plan must include a standardized mechanism to report any observations of dead or injured red-legged frog to the appropriate Corps and Service offices.

6. A Service-approved biologist shall survey the project site within two weeks before the onset of activities. If red-legged frogs are found in the project area and these individuals are likely to be killed or injured by work activities, the Service-approved biologist will allow sufficient time to move them from the site before work activities resume. Only Service-approved biologists will participate in activities with the capture, handling, and monitoring of red-legged frogs.

7. Before any project-related activities, the approved biologist must identify appropriate areas to receive red-legged frog adults and tadpoles from the project areas. These areas must be in proximity to the capture site, contain suitable habitat, not be affected by project activities, and be free of exotic predatory species (i.e. bullfrogs, crayfish) to the best of the approved biologist's knowledge.

8. Prior to the onset of project activities, a Service-approved biologist shall conduct a training session for all construction personnel. At a minimum, the training shall include a description of the red-legged frog and its habitat, the importance of the red-legged frog and its habitat, the general measures that are being implemented to conserve the red-legged frog as they relate to the project, and the boundaries within which the project may be accomplished.

Brochures, books and briefings may be used in the training session, provided that a qualified person is on hand to answer any questions.

9. A Service-approved biologist shall be present at the work site until such time as removal of red-legged frogs, instruction of workers, and habitat disturbance has been completed. The Service-approved biologist shall have the authority to halt any action that might result in impacts that exceed the levels anticipated by the Corps and Service during review of the proposed action. If work is stopped, the Corps and the Service shall be notified immediately by the Service-approved biologist or on-site biological monitor.

10. All fueling and maintenance of vehicles and other equipment and staging areas will occur at least 65 feet from any riparian habitat or water body. The Corps and the CDFW will ensure contamination of habitat does not occur during such operations. Prior to the onset of work, the CDFW will ensure that the contractor has prepared a plan to allow a prompt and effective response to any accidental spills. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.
11. If red-legged frogs are found and these individuals are likely to be killed or injured by work activities, the Service-approved biologists must be allowed sufficient time to move them from the site before work activities resume. The Service-approved biologist must relocate the red-legged frogs the shortest distance possible to one of the predetermined areas. The Service-approved biologist must maintain detailed records of any individuals that are moved (e.g., size, coloration, any distinguishing features, photographs (digital preferred) to assist in determining whether translocated animals are returning to the point of capture. Only red-legged frogs that are at risk of injury or death by project activities may be moved.

12. If a work site is to be temporarily dewatered by pumping, intakes shall be completely screened with wire mesh not larger than 0.125 inch to prevent red- legged frogs from entering the pump system. Water shall be released or pumped downstream at an appropriate rate to maintain down stream flows during construction activities and eliminate the possibility of ponded water. 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.

13. Ponded areas shall be monitored for red-legged frogs that may become entrapped. Any entrapped red-legged frog shall be relocated to a pre- determined receiving area by a Service-approved biologist.

14. A Service-approved biologist will permanently remove from the project area, any individuals of exotic species, such as bullfrogs, centrarchid fishes, and non-native crayfish to the maximum extent possible. The biologist will have the responsibility to ensure that their activities are in compliance with the Fish and Game Code.

15. CDFW will notify the Service of any injuries or mortalities within 24 hours of the incident.

Tidewater Goby

1. No projects will occur within lagoons that may contain tidewater goby or tidewater goby habitat., or that may negatively indirectly impact downstream tidewater goby habitat.

California Freshwater Shrimp

1. Project activities in potential shrimp habitat shall be restricted to the period between July 1 and November 1.

2. A California freshwater shrimp relocation plan will be in place prior to work in any potential habitat identifying location(s) to relocate individuals that may be encountered.

3. At least 15 days prior to the onset of activities, CDFW shall submit the name(s) and credentials of biologists who will conduct activities specified in the following measures to the Service. The grantee shall implement any additional conservation measures requested by CDFW and/or the Service.

    a. CDFW shall be notified at least one week in advance of the date on which work will start in the stream, so that a service-approved biologist can monitor activities at the work site. All work in the stream shall be stopped immediately if it is determined by CDFW that the work has the potential to adversely impact shrimp or its habitat. Work shall not recommence until CDFW is satisfied that there will be no impact on the shrimp.

    b. Where appropriate, a Service-approved biologist will survey each site for shrimp before allowing work to proceed and prior to issuance of a Streambed Alteration Agreement. All overhanging vegetation, undercut banks, and tree roots will be surveyed with a butterfly net or fish net.

    c. Prior to the onset of work at a work site that may contain shrimp, the Service-approved biologist shall conduct a training session for all construction personnel. At a minimum the training shall include a description of the shrimp and its habitat, the importance of the shrimp and its habitat, the general measures that are being implemented to conserve the shrimp as they relate to the work site, and the work site boundaries where construction may occur.

    d. Only Service-approved biologists shall participate in the capture, handling, and monitoring of shrimp. CDFW shall report annually on the number of capture, release and injuries/mortality and agrees to modify capture/release strategy with Service staff as needed to prevent adverse effects.

4. In site locations where shrimp are present, CDFW will require the grantee to implement the mitigation measures listed:

    a. Equipment work shall be performed only in riffle, shallow run, or dry habitats, avoiding low velocity pool and run habitats occupied by shrimp, unless shrimp are relocated according to the protocol described below. "Shallow" run habitat is defined as a run with a maximum water depth, at any point, less than 12 inches, and without undercut banks or vegetation overhanging into the water.

    b. Hand placement of logs or rocks shall be permitted in pool or run habitat in stream reaches where shrimp are known to be present, only if the placement will not adversely affect shrimp or their habitat.

c. Care shall be taken during placement or movement of materials in the stream to prevent any damage to undercut stream banks and to minimize damage to any streamside vegetation. Streamside vegetation overhanging into pools or runs shall not be removed, trimmed, or otherwise modified.

d. No log or rock weirs (including vortex rock weirs), or check dams shall be constructed that would span the full width of the low flow stream channel. Vegetation shall be incorporated with any structures involving rocks or logs to enhance migration potential for shrimp.

e. No dumping of dead trees, yard waste or brush shall occur in shrimp streams, which may result in oxygen depletion of aquatic systems.

5. If in the opinion of the Service-approved biologist, adverse effects to shrimp would be further minimized by moving shrimp away from the project site, the following procedure shall be used:

   a. A second survey shall be conducted within 24 hours of any construction activity and shrimp shall be relocated to the nearest suitable habitat. Shrimp shall be moved while in the net, or placed in buckets containing stream water. Stress and temperature monitoring of shrimp shall be performed by the Service-approved biologist. Numbers of shrimp and any mortalities or injuries shall be identified and recorded. Shrimp habitat is defined as reaches in low elevation (less than 116 m) and low gradient (less than one percent) streams where banks are structurally diverse with undercut banks, exposed fine root systems, overhanging woody debris or overhanging vegetation.

6. A Service-approved CDFW biologist shall be present at the work site until such time as all removal of shrimp, instruction of workers, and habitat disturbance associated with the restoration project have been completed.

7. The Service-approved biologist shall have the authority to halt any action that might result in the loss of any shrimp or its habitat. If work is stopped, the Service-approved biologist shall immediately notify CDFW and the Service.

8. If a work site is temporarily dewatered by pumping, intakes shall be completely screened with wire mesh no larger than 0.2 inch to prevent shrimp from entering the pump system. 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 with the least disturbance to the substrate.

9. A Service-approved biologist shall permanently remove from within the project work site, any individuals of exotic species, such as bullfrogs, centrarchid fishes, and non-native crayfish, to the maximum extent possible. The grantee shall have the responsibility that such removals are done in compliance with the California Department of Fish and Wildlife.

10. Invasive non-native vegetation that provides shrimp habitat and is removed as a result of Program activities shall be replaced with native vegetation that provides comparable habitat for the shrimp. Re-vegetated sites shall be irrigated as necessary until vegetation is established. Re-vegetated sites shall be monitored until shading and cover achieves 80% of pre-project shading and cover and for a minimum of 5 years.

San Francisco Garter Snake

1. A Service approved biologist will conduct preconstruction surveys and monitor for San Francisco garter snake prior to implementation of project activities. If San Francisco garter snakes are identified at the project site, work will be halted. If the identified animal(s) do not leave the project area of their own volition, the Service and California Department of Fish and Wildlife will be contacted to determine appropriate actions. Only Service-approved biologists will participate in activities associated with the capture, handling, or relocation of San Francisco garter snake.

2. Exclusion fencing shall be established around staging areas and soil stockpile areas. Exclusion fencing shall include escape funnels and the lower edge of the fence shall be buried at least four (4) inches to prevent burrowing animals from tunneling under the fence. Exclusion fence posts will be placed on the inside to prevent snakes from being able to climb into the project site.

3. The Service-approved biologist will conduct daily inspections of the project work area, staging area, and the perimeter of any exclusion fencing prior to the commencement of construction activities. Upon completion equipment or materials may be moved onto the work site and project activities may commence with a Service-approved monitor.

4. The exclusion fencing will remain in operating condition for the duration of the project. The biological monitor shall daily inspect the integrity of the exclusion fencing to ensure there are no gaps, tears or damage. Maintenance of the fencing shall be conducted as needed. Any necessary repairs to the fencing shall be completed within 24 hours of the initial observance of the damage.

5. A Service approved biological monitor will be on-site while all project activities are being conducted. The monitor will walk in front of equipment to ensure San Francisco garter snake are not crushed.

6. Vegetation removed shall be kept within the exclusion fencing or placed into a disposal vehicle and removed from the project site. Vegetation will not be piled on the ground outside fencing unless it is later transferred, piece by piece, under the direct supervision of the Service-approved biologist.

7. Soil will not be stockpiled unless it is on a paved surface or an area where burrows are absent. The Service-approved biologist will approve such locations within the defined work area.

8. If San Francisco garter snake are found on site, the construction contractor shall stop work and contact the Service immediately and allow the San Francisco garter snake to leave on its own volition.

9. Prior to work, all burrows will be flagged and avoided to prevent their collapse.

10. All workers will check stockpiled construction materials, and under equipment to be moved for presence of wildlife sheltering within them prior to use.

11. Any vehicle parked on site for more than 15 minutes will be inspected before it is moved to ensure that San Francisco garter snake have not moved under the vehicle.

12. The Service-approved biological monitor shall have the responsibility and authority of stopping the project if any crews or personnel are not complying with the Biological Opinion.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the proposed project, the action area encompasses all anadromous fish-bearing streams to top of bank in: Alameda, Contra Costa, Lake, Marin, Lake, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties; and associated uplands and adjacent wetlands utilized for staging and access.

Analytical Framework for the Jeopardy Determination

In accordance with policy and regulation, the jeopardy analyses in this biological opinion relies on four components: (1) the *Status of the Species*, which evaluates the California red-legged frog, San Francisco garter snake, and California freshwater shrimp range-wide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the California red-legged frog, San Francisco garter snake, and California freshwater shrimp in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the California red-legged frog, San Francisco garter snake, and California freshwater shrimp; (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 California red-legged frog, San Francisco garter snake, and California freshwater shrimp; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the California red-legged frog, San Francisco garter snake, and California freshwater shrimp.

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 California red-legged frog, San Francisco garter snake, and California freshwater shrimp 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 the(se) species in the wild.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of California red-legged frog, San Francisco garter snake, and California freshwater shrimp and the role of the action area in the survival and recovery of California red-legged frog, San Francisco garter snake, and California freshwater shrimp 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.

Status of the Species and Environmental Baseline

For this Programmatic Opinion the Status of the Species will serve as the environmental baseline due to the large area the Program will function in. The appendages to this Programmatic Opinion will detail Project level Environmental Baseline.

California Red-legged Frog

Listing Status

The California red-legged frog was listed as a threatened species on May 23, 1996 (Service 1996). Critical habitat was re-designated for this species on March 17, 2010 (Service 2010). A recovery plan was published for the California red-legged frog on September 12, 2002 (Service 2002).

Description

The California red-legged frog is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 2003). The abdomen and hind legs of adults are largely red, while the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background. Dorsal spots usually have light centers (Stebbins 2003), and dorsolateral folds are prominent on the back. California red-legged frogs have paired vocal sacs and vocalize in air (Hayes and Krempels 1986). 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 red-legged frog extended coastally from the vicinity of Elk Creek in Mendocino County, California, and inland from the vicinity of Redding, Shasta County, California, southward to northwestern Baja California, Mexico (Jennings and Hayes 1985; Hayes and Krempels 1986; Fellers 2005). The red-legged frog was historically documented in 46 California counties but the taxon now remains in 238 streams or drainages within 23 counties, representing a loss of 70 percent of its former range (Service 2002). California red-legged frogs are still locally abundant within portions of the San Francisco Bay area and the Central Coast. Within the remaining distribution of the species, only isolated populations have been documented in the Sierra Nevada, northern Coast Range, northern Transverse Ranges, southern Transverse Ranges, and Peninsular Ranges.

Status and Natural History

California red-legged frogs predominately inhabit permanent water sources such as streams, lakes, marshes, natural and man-made 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, California red-legged frogs also have been found in ephemeral creeks and drainages and in ponds that may or may not have riparian vegetation. California red-legged frogs also can be found in disturbed areas such as channelized creeks and drainage ditches in urban and agricultural areas. For example, an adult California red-legged frog was observed in a shallow isolated pool on North Slough Creek in the American Canyon area of Napa County (C. Gaber, PG&E, pers. comm., 2008). This frog location was surrounded by vineyard development. Another adult California red-legged

frog was observed under debris in an unpaved parking lot in a heavily industrial area of Burlingame (P. Kobernus, Coast Ridge Ecology, pers. comm., 2008). This frog was likely utilizing a nearby drainage ditch. Caltrans also has discovered California red-legged frog adults, tadpoles, and egg masses within a storm drainage system within a major cloverleaf intersection of Millbrae Avenue and SR 101 in a heavily developed area of San Mateo County (Caltrans 2007). California red-legged frog has the potential to persist in disturbed areas as long as those locations provide at least one or more of their life history requirements.

California red-legged frogs typically breed between November and April in still or slow-moving water at least 2.5 feet in depth with emergent vegetation, such as cattails, tules or overhanging willows (Hayes and Jennings 1988). There are earlier breeding records from the southern portion of their range (Storer 1925). 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). Individuals occurring in coastal areas are active year-round (Jennings *et al.* 1992), whereas those found in interior sites are normally less active during the cold and dry seasons.

During other parts of the year, habitat includes nearly any area within 1-2 miles of a breeding site that stays moist and cool through the summer (Fellers 2005). According to Fellers (2005), this can include vegetated areas with coyote brush, California blackberry thickets, and root masses associated with willow and California bay trees. Sometimes the non-breeding habitat used by California red-legged frogs is extremely limited in size. For example, non-breeding California red-legged frogs have been found in a 6-foot wide coyote brush thicket growing along a small intermittent creek surrounded by heavily grazed grassland (Fellers 2005). Sheltering habitat for California red-legged frogs is potentially all aquatic, riparian, and upland areas within the range of the species and includes any landscape features that provide cover, such as existing 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 structures, 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). Adult frogs are often associated with permanent bodies of water. Some frogs remain at breeding sites all year while others disperse. Dispersal distances are typically less than 0.5 mile, with other 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 over 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, Tatarian (2008) noted that 57 percent of frogs fitted with radio transmitters in the Round Valley study area in eastern Contra Costa County stayed at their breeding pools, whereas 43 percent moved into adjacent upland habitat or to other aquatic sites. This study reported a peak of seasonal terrestrial movement occurring in the fall months, with movement commencing with the first 0.2 inch of precipitation. Movements away from the source pools tapered 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 bases of trees or rocks, logs, and a downed barn door; others were associated with upland sites lacking refugia (Tatarian 2008). The majority of terrestrial movements lasted from 1-4 days; however, an adult female was reported to remain in upland habitat for 50 days (Tatarian 2008). Uplands closer to aquatic sites were used more often and frog refugia 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 2,000-5,000 eggs are attached to vegetation below the surface and hatch after 6-14 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 results 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 3.5-7 months following hatching and reach sexual maturity at 2-3 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). Sexual maturity normally is reached at 3-4 years of age (Storer 1925; Jennings and Hayes 1985). California red-legged frogs may live 8-10 years (Jennings *et al.* 1992). Populations of California red-legged frogs fluctuate from year to year. When conditions are favorable California red-legged frogs can experience 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, California red-legged frogs may temporarily disappear from an area when conditions are stressful (*e.g.*, drought).

California red-legged frogs have a diverse diet which changes as they mature. The diet of larval California red-legged frogs 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 surfaces 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 tree frogs, 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).

Metapopulation and Patch Dynamics

The direction and type of habitat used by dispersing animals is especially important in fragmented environments (Forys and Humphrey 1996). Models of habitat patch geometry predict that individual animals will exit patches at more "permeable" areas (Buechner 1987; Stamps *et al.* 1987). A landscape corridor may increase the patch-edge permeability by extending patch habitat (La Polla and Barrett 1993), and allow individuals to move from one patch to another. The geometric and habitat features that constitute a "corridor" must be determined from the perspective of the animal (Forys and Humphrey 1996).

Because their habitats have been fragmented, many endangered and threatened species exist as metapopulations (Verboom and Apeldom 1990; Verboom *et al.* 1991). A metapopulation is a collection of spatially discrete subpopulations that are connected by the dispersal movements of the individuals (Levins 1970; Hanski 1991). For metapopulations of listed species, a prerequisite to recovery is determining if unoccupied habitat patches are vacant due to the attributes of the habitat patch (food, cover, and patch area) or due to patch context (distance of the patch to other patches and distance of the patch to other features). Subpopulations of patches with higher quality food and cover are more likely to persist because they can support more individuals. Large populations have less of a chance of extinction due to stochastic events (Gilpin and Soule 1986). Similarly, small patches will support fewer individuals, increasing the rate of extinction. Patches that are near occupied patches are more likely to be recolonized when local extinction occurs and may benefit from emigration of individuals via the "rescue" effect (Hanski 1982; Fahrig and Merriam 1985; Gotelli 1991; Holt 1993). For the metapopulation to persist, the rate of patches being colonized must exceed the rate of patches going extinct (Levins 1970). If some subpopulations go extinct regardless of patch context, recovery actions should be placed on patch attributes. Patches could be managed to increase the availability of food and/or cover.

Movements and dispersal corridors likely are critical to California red-legged frog population dynamics, particularly because the animals likely currently persist as metapopulations with disjunct population centers. Movement and dispersal corridors are important for alleviating over-crowding and intraspecific competition, and also they are important for facilitating the recolonization of areas where the animal has been extirpated. Movement between population centers maintains gene flow and reduced genetic isolation. Genetically isolated populations are at greater risk of deleterious genetic effects such as inbreeding, genetic drift, and founder effects. The survival of wildlife species in fragmented habitats may ultimately depend on their ability to move among patches to access necessary resources, retain genetic diversity, and maintain reproductive capacity within populations (Petit *et al.* 1995; Buza *et al.* 2000; Hilty and Merenlender 2004).

Most metapopulation or metapopulation-like models of patchy populations do not directly include the effects of dispersal mortality on population dynamics (Hanski 1994; With and Crist 1995; Lindenmayer and Possingham 1996). Based on these models, it has become a widely held notion that more vagile species have a higher tolerance to habitat loss and fragmentation than less vagile species. But models that include dispersal mortality predict the opposite: more vagile species should be more vulnerable to habitat loss and fragmentation because they are more susceptible to dispersal mortality (Fahrig 1998; Casagrandi and Gatto 1999). This prediction is supported by Gibbs (1998), who examined the presence-absence of five amphibian species across a gradient of habitat loss. He

found that species with low dispersal rates are better able than more vagile species to persist in landscapes with low habitat cover. Gibbs (1998) postulated that the land between habitats serves as a demographic "drain" for many amphibians. Furthermore, Bonnet *et al.* (1999) found that snake species that use frequent long-distance movements have higher mortality rates than do sedentary species.

Threats

Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the red-legged frog throughout its range. Several researchers in central California have noted the decline and eventual local disappearance of California and northern California red-legged frogs (*Rana aurora*) 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 California red-legged frogs, and suggested that bullfrogs could prey on subadult northern 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). Furthermore, bullfrog larvae are unpalatable to predatory fish (Kruse and Francis 1977). Bullfrogs also interfere with red-legged frog reproduction. Thus bullfrogs are able to prey upon and out-compete California red-legged frogs, especially in sub-optimal habitat. Both California and northern California red-legged frogs have also been observed in amplexus (mounted on) with both male and female bullfrogs (Jennings and Hayes 1990; Jennings 1993; Twedt 1993).

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

Diseases may also pose a significant threat though the specific effects of diseases on the California red-legged frog are not known. Pathogens are suspected of causing global amphibian declines (Davidson *et al.* 2003). Chytridiomycosis and ranaviruses are a potential threat to the red-legged frog because these diseases have been found to adversely affect other amphibians, including the listed species (Davidson *et al.* 2003; Lips *et al.* 2003). 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.* 2005). Human activities 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 or fishing equipment). Human activities can also introduce stress by other means, such as habitat fragmentation, that results in the listed species being more susceptible to the effects of disease. Disease will likely become a growing threat because of the relatively small and fragmented remaining California red-legged frog breeding sites, the many stresses on these sites due to habitat losses and alterations, and the many other potential disease-enhancing anthropogenic changes that have occurred both inside and outside the species' range.

Negative effects to wildlife populations from roads and pavement may extend some distance from the actual road. The phenomenon can result from any of the effects, such as vehicle-related

mortality, habitat degradation, and invasive exotic species. Forman and Deblinger (1998, 2000) described the area affected as the "road effect" zone. Along a 4-lane road in Massachusetts, they determined that this zone extend for an average of approximately 980 feet to either side of the road for an average total zone width of approximately 1,970 feet. They describe the boundaries of this zone as asymmetric and in some areas diminished wildlife use attributed to road effects was detected greater than 0.6 mile from Massachusetts Route 2. The "road-zone" effect can also be subtle. Van der Zande *et al.* (1980) reported that lapwings and black-tailed godwits feeding at 1,575-6,560 feet from roads were disturbed by passing vehicles. The heart rate, metabolic rate and energy expenditure of female bighorn sheep increase near roads (MacArthur *et al.* 1979). Trombulak and Frissell (2000) described another type of "road-zone' effect due to contaminants. Heavy metal concentrations from vehicle exhaust were greatest within 66 feet of roads, but elevated levels of metals in both soil and plants were detected at 660 feet of roads. The "road-zone" apparently varies with habitat type and traffic volume. Based on responses by birds, Forman (2000) estimated the effect zone along primary roads of 1,000 feet in woodlands, 1,197 feet in grasslands, and 2,657 feet in natural lands near urban areas. Along secondary roads with lower traffic volumes, the effect zone was 656 feet. The "road-zone" effect with regard to California red-legged frogs has not been adequately investigated.

The necessity of moving between multiple habitats and breeding ponds means that many amphibian species, such as the California red-legged frog, are especially vulnerable to death and injury due to roads and well-used large paved areas in the landscape. Van Gelder (1973) and Cooke (1995) have examined the effect of roads on amphibians and found that because of their activity patterns, population structure, and preferred habitats, aquatic breeding amphibians are more vulnerable to traffic mortality than some other species. Large, high-volume highways pose a nearly impenetrable barrier to amphibians and result in mortality to individual animals as well as significantly fragmenting habitat. Hels and Buchwald (2001) found that mortality rates for anurans on high traffic roads are higher than on low traffic roads. Vos and Chardon (1998) found a significant negative effect of road density on the occupation probability of ponds by the moor frog (*Rana arvalis*) in the Netherlands. In addition, incidents of very large numbers of road-killed frogs are well documented (*e.g.*, Ashley and Robinson 1996), and studies have shown strong population level effects of traffic density (Carr and Fahrig 2001) and high traffic roads on these amphibians (Van Gelder 1973; Vos and Chardon 1998). Most studies regularly count road kills from slow moving vehicles (Hansen 1982; Rosen and Lowe 1994; Drews 1995; Mallick *et al.* 1998) or by foot (Munguira and Thomas 1992). These studies assume that every victim is observed, which may be true for large conspicuous mammals, but it certainly is not true for small animals, such as the California red-legged frog. Amphibians appear especially vulnerable to traffic mortality because they readily attempt to cross roads, are slow-moving and small, and thus cannot easily be avoided by drivers (Carr and Fahrig 2001).

San Francisco Garter Snake

Refer to the *San Francisco Garter Snake (Thamnophis sirtalis tetrataenia) 5-Year Review: Summary and Evaluation* (Service 2006) for the current Status of the Species.

California Freshwater Shrimp

The California freshwater shrimp was listed as an endangered species on October 31, 1988 (Service 1988). A detailed account of the California freshwater shrimp's taxonomy, biology, and ecology is presented in the *Recovery Plan for the California Freshwater Shrimp* (Service 1998).

The California freshwater shrimp is a decapod crustacean of the family Atyidae. The Atyidae family includes four species in the United States including both members of the genus *Syncaris*. *Syncaris pasadenae*, which inhabited streams of southern California, is presumed extinct leaving *Syncaris pacifica* as the only representative of this genus in the United States. Martin and Wicksten (2004) noted that all individuals of *S. pacifica* examined lacked dorsal rostral teeth, while no individual of *S. pacifica* were without them. According to Eng (1981), adults of *S. pacifica* are generally less than 2 inches in postorbital length (from eye orbit to tip of tail). Based on shrimp collected in October, Eng (1981) described females ranging between 1.26-1.77 inches in length and males from 1.14-1.52 inches in length. California freshwater shrimp coloration is variable. Juvenile and adult male California freshwater shrimp are translucent to nearly transparent (Martin and Wicksten 2004) with small surface and internal color-producing cells (chromatophores) clustered in patterns to disrupt their body outlines. Females are similar in coloration, but have been known to be brown or purple (Eng 1981; Martin and Wicksten 2004). Both sexes can darken or lighten their color, but females have this ability to a larger degree (Service 1998). Undisturbed shrimp move slowly and are virtually invisible on submerged leaf and twig substrates and among fine, exposed, live tree roots along undercut stream banks.

The California freshwater shrimp was likely common in perennial freshwater streams within Marin, Sonoma, and Napa counties. Today, it is found in 23 streams within these counties that can be separated into four general geographic regions: (1) tributary streams in the lower Russian River drainage, (2) coastal streams flowing to the Pacific Ocean, (3) streams draining into Tomales Bay, and (4) streams flowing southward to San Pablo Bay. Many of these streams contain California freshwater shrimp populations that are now isolated from each other.

The California freshwater shrimp has only been found in low elevation (less than 380 feet) and low gradient (generally less than 1 percent) streams (Service 1998). It is generally found in stream reaches where banks are structurally diverse with undercut banks, exposed fine root systems, overhanging woody debris, or overhanging vegetation (Eng 1981; Serpa 1986 and 1991). Excellent habitat conditions for California freshwater shrimp involve streams 12 to 36 inches in depth with live roots along undercut banks that are greater than 6 inches with overhanging stream vegetation and vines (Serpa 1991). Such microhabitats may provide protection from high velocities and sediment loads associated with high stream flows. Where California freshwater shrimp are present in two connecting watercourses, smaller tributaries generally support greater numbers of California freshwater shrimp than their larger receiving streams. With the exception of Yulupa Creek, California freshwater shrimp have not been found in stream reaches with boulder and bedrock bottoms. High velocities and turbulent flows in such reaches may hinder upstream movement of California freshwater shrimp.

Habitat preferences apparently change during late spring and summer months. Eng (1981) rarely found California freshwater shrimp beneath undercut banks in summer; submerged leafy branches were the preferred summer habitat. In Lagunitas Creek in Marin County, the animal was found in a wide variety of trailing, submerged vegetation (Li 1981). Highest concentrations of California freshwater shrimp were observed in reaches with adjacent vegetation comprised of stinging nettles (*Urtica* sp.), grasses, blackberry (*Rubus* sp.), and mint (*Mentha* sp.). None were caught in areas with cattails (*Typha* sp.), cottonwood (*Populus fremontii*), or California laurel (*Umbellularia californica*). Serpa (pers. comm. 1994 cited in Service 1998) noted that populations of California freshwater shrimp were proportionally correlated with the quality of summer habitat provided by trailing terrestrial vegetation. However, during summer low flows, California freshwater shrimp have been found in apparently poor habitat such as isolated pools with minimal cover. In such streams, opaque waters

may allow California freshwater shrimp to escape predation and persist in open pools (Serpa 1991). Further research is needed to determine if both winter and summer habitat needs to be provided within the same location or if California freshwater shrimp can move between areas containing either winter or summer habitat (Service 1998).

The California freshwater shrimp has evolved to survive a range of stream and water temperature conditions characteristic of small, perennial coastal streams. However, no data are available for defining the optimum temperature and stream flow regime for the California freshwater shrimp or the limits it can tolerate. The California freshwater shrimp appears to be able to tolerate warm water temperatures (greater than 73 degrees Fahrenheit) and low flow conditions that are detrimental or fatal to native salmonids. Although largely absent from existing streams, large, complex organic debris dams may have been prevalent in streams supporting California freshwater shrimp populations. These structures may have been important feeding and refugial (resting) sites for the California freshwater shrimp. Such structures are known to collect detrital material (i.e., food) as well as leaf litter, which can be later broken down by microbial activity and invertebrates to finer, detrital material (Triska *et al.* 1982). In addition, debris dams may offer shelter during high flow events and reduce displacement of invertebrates (Covich *et al.* 1991). Some debris dams may break apart during high flow events and allow California freshwater shrimp to disperse periodically and maintain genetic connections among populations.

Following a feeding group classification system by Merritt and Cummins (1978), atyid California freshwater shrimp can be described as collectors feeding upon fine particulate organic matter (Anderson and Cummins 1979; Eng 1981; Goldman and Horne 1983). California freshwater shrimp reach sexual maturity at the end of the second summer, and reproduction appears to occur once a year. Based upon the reproductive physiology and behavior of other freshwater shrimp, the male probably transfers and fixes a sperm sac to the female California freshwater shrimp after her last molt, before autumn. Most adult females in Huichica Creek are bearing eggs by November (Serpa 1991). Females produce approximately 50 to 120 eggs (Hedgpeth 1968; Eng 1981). No information is available on the percentage of larvae that reach reproductive maturity. The California freshwater shrimp does not have life history characteristics that favor quick recovery following disturbances, having low fecundity and a long maturation period.

The California freshwater shrimp has relatively low fecundity, is believed to reproduce only once a year, and requires over one year to reach sexual maturity. Wallace (1990) summarized studies that have shown mollusks to be one of the last taxa to recolonize disturbed stream reaches, whereas insect colonization occurs faster. California freshwater shrimp may be even less adapted to disturbances than mollusks. The California freshwater shrimp has no known resistant or dormant life stage that would allow it to survive a toxic event such as a chemical spill.

Existing California freshwater shrimp distribution in streams is not continuous, and the species often occupies only short reaches of the stream (Service 1998). However, entire streams are considered California freshwater shrimp habitat, because the California freshwater shrimp disperses between areas of good habitat. A population may expand or contract depending upon conditions within streams. For example, long-term drought conditions may have resulted in more discontinuous California freshwater shrimp populations in Huichica Creek (Serpa 1991). A recovery objective for the California freshwater shrimp is the gradual removal of unnatural barriers to California freshwater shrimp dispersal and restoration of natural habitat conditions (Service 1998). These measures are expected to expand California freshwater shrimp distribution beyond its existing range.

To date, Lagunitas Creek is the only shrimp stream with long term population data. According to information from Serpa (2002) shrimp populations in Lagunitas Creek increased from 1994 through 2000 from approximately 1,465 individuals to 4,407 respectively. The increase followed an increase in linear feet of pool habitat within the creek. However, an unpublished paper from Quinlan (2006) reports additional shrimp population data in Lagunitas Creek from 2000 - 2004, in which the number of individuals decreased from approximately 4,400 to 2,100 respectively, which was inversely related to an increase in mean stream width.

In the Huichica Creek watershed, the Napa County Resource Conservation District created the Huichica Creek Land Stewardship group consisting of watershed landowners, local, State, and Federal agencies (including the Service), to develop and implement a long-term conservation plan for the watershed. A major benefit of this effort has been the willingness of many winery operations to participate in this program and their increased awareness of the need to protect aquatic resources, including the California freshwater shrimp. The plan includes measures recommended by the Service to reduce the risk of pesticides entering streams and a standard screen design for water intake structures to prevent take of California freshwater shrimp. In addition, the Natural Resource Protection and Enhancement Plan (Napa County RCD 1993) developed for the watershed recommends use of cover crops to minimize soil erosion and water conservation measures. A reduction in unnatural amounts of fine sediments in Huichica Creek was observed after implementation of the plan's recommendations by landowners (D. Bowker pers. comm. 1994 cited in Service 1998).

A number of restoration projects undertaken by the Bay Institute, through the Students and Teachers Restoring a Watershed (STRAW) program, have been implemented to improve habitat for the shrimp since 1993; these projects have focused on removing exotic vegetation, planting native species, erecting livestock exclusion fencing, and installing cattle bridges (L. Rogers, The Bay Institute, per. comm. 2006). To date, the STRAW project has completed approximately 185 projects restoring over 50,000 linear feet of stream bank. The Service's Partners for Fish and Wildlife program has provided some funding for these restoration efforts; in these instances contracts for the continued management of the properties for the benefit of wildlife are in place, but the contracts will eventually expire and do not represent long term protection (D. Strait, Fish and Wildlife biologist, Service, per. comm. 2006).

Threats to the California freshwater shrimp include viticulture operations, irrigation diversions, sewage, bank protection measures, migration barriers (*e.g.*, culverts, bridge footings/sills, and grade control structures), urban residential/commercial development, and introduced predators (Service 1998). Introduced fish may affect California freshwater shrimp distribution significantly through predation. Carp (*Cyprinus carpio*) occur in Stemple Creek (Serpa 1986), which dislodge and consume invertebrates from plants and silty bottoms through their rooting activities (Moyle 1976). Introduced sunfish (*Lepomis cyanellus*) and mosquitofish (*Gambusia affinis*) are likely California freshwater shrimp predators (Service 1998). Williams (1977) found no coexistence between mosquitofish and atyids in Hawaiian streams. Because of the relatively recent introduction of these fish, the California freshwater shrimp probably has not developed defense mechanisms to reduce their risk of predation. Like the California freshwater shrimp, many introduced fish can persist under relatively poor water quality conditions in the absence of natural predators such as juvenile steelhead (*Oncorhynchus mykiss*).

Effects of the Action

General Effects

Direct effects to adult and juvenile shrimp and to red-legged frog adults, sub-adults, tadpoles, and eggs in the footprint of projects utilizing the proposed authorization would include injury or mortality from being crushed by earth-moving equipment, construction debris, and worker foot traffic. These effects would be reduced by minimizing and clearly demarcating the boundaries of the project areas.

Shrimp and red-legged frog tadpoles may be entrained by pump or water diversion intakes. Screening pump intakes with wire with not greater than 0.2-inch diameter mesh may reduce the potential that shrimp and tadpoles would be caught in the inflow.

Shrimp and red-legged frogs may be killed by predators. If water that is impounded during or after work activities creates favorable habitat for non-native predators, such as bullfrogs, crayfish, and centrarchid fishes, shrimp and red-legged frogs may incur abnormally high rates of predation. Additionally, any time red-legged frogs are concentrated in a small area at unusually high densities, native predators may feed on them opportunistically. This impact can be minimized by avoiding creation of ponded water as a result of project actions such as dewatering the work area.

Trash left during or after project activities could attract predators to work sites, which could, in turn, prey on shrimp and red-legged frogs. For example, raccoons are attracted to trash and also prey opportunistically on both species. This potential impact can be reduced or avoided by careful control of waste products at all work sites.

Accidental spills of hazardous materials or careless fueling or oiling of vehicles or equipment could degrade water quality to a degree where shrimp or red-legged frogs are injured or killed. The potential for this effect to occur can be reduced by thoroughly informing workers of the importance of preventing hazardous materials from entering the environment, locating staging and fueling areas a minimum of 65 feet from riparian areas or other water bodies, and by having an effective spill response plan in place.

Uninformed workers could disturb, injure, or kill shrimp or red-legged frogs. The potential for this effect to occur may be greatly reduced by informing workers of the presence and protected status of this species and the measures that are being implemented to protect it during project activities.

The restoration projects that would utilize the proposed authorization are intended to provide additional habitat for, and increased populations of, steelhead and salmon in the respective project areas. These fish prey on the shrimp and the red-legged frog. The effects of potentially increasing predator populations on the shrimp and red-legged frog cannot be accurately predicted at this time. Shrimp, salmon and steelhead occurred in coastal watersheds prior to the onset of human disturbance. Although we anticipate some predation of shrimp and red-legged frogs by salmonid fishes, this level of predation is not expected to appreciably alter the population structure within the project areas.

While the activities are not specifically addressed individually, they are all within anadromous fish-bearing streams, and the areas around them. The projects are no larger than 500 contiguous feet, and generally short in duration with projects taking place over a short work window during a calendar

is unlikely that several projects would be conducted concurrently in the same location. Additionally, the need to receive individual appendages will ensure that in this rare case the effects of several actions in an area or watershed could be adequately described and additional potential minimization and avoidance measures for federally listed species.

The Corps' proposed authorization would affect a small number of shrimp and red-legged frogs, if any occur in the areas that would be temporarily disturbed by project activities. Due to the small size of the work areas, the temporal nature of the projects, the implementation of the projects in the dry season, and the proposed protective measures, we anticipate that few California red-legged frog, San Francisco garter snake or California freshwater shrimp will be killed or injured during project activities. The areas disturbed by Program projects constitute a small portion of the available shrimp and red-legged frog habitat throughout the Corps' San Francisco District's jurisdiction; additionally, disturbed areas will be restored and planted with native plants. Restoration and enhancement of riparian vegetation and stream complexity in project sites is likely to increase the number and quality of cover sites and the diversity and abundance of prey species for California red-legged frogs, San Francisco garter snake and California freshwater shrimp. The proposed authorization is generally likely to improve the quality of habitat for the red-legged frog in areas affected by projects implemented under the Program.

California Red-Legged Frog

Work activities, including noise and vibration, may cause red-legged frogs to leave the work area. This disturbance may increase the potential for predation and desiccation. Minimizing the area disturbed by project activities may reduce the potential for dispersal resulting from the action. Red-legged frogs are more likely to disperse overland in mesic conditions. Because the CDFW would primarily be executing the proposed projects during the dry season, these uplands impacts are less likely. As long as no substantial rainfall (substantial rainfall = greater than 0.5 inch of rain in a 24-hour period) occurs, California red-legged frogs dispersing through the uplands are unlikely to be at risk. Individuals seeking refuge in the stream are likely to move into adjacent habitat ourside of the Project.

Work in live streams or in floodplains could cause unusually high levels of siltation downstream. This siltation could smother eggs of the red-legged frog and alter the quality of the habitat to the extent that use by individuals of the species is precluded. Implementing best management practices for erosion control and reducing the area to be disturbed to the minimum necessary should decrease the amount of sediment that is washed downstream as a result of project activities.

The Program will not result in the temporary loss of red-legged frog habitat. The restoration projects will provide more stable stream banks, better water quality through decreased erosion and sediment loading, and shelter along stream banks for red-legged frogs. Additionally, many of the projects will improve red-legged frog habitat by creating additional pools and providing a more natural water flow regime by eliminating or altering fish passage barriers. The restoration projects will contribute to the local recovery of the red-legged frog by removing non-native predators such as bullfrogs, which out-compete and ultimately displace red-legged frogs from suitable habitat, and by improving the riparian buffer which will reduce the movement of pesticides into the aquatic environment.

San Francisco Garter Snake

Direct effects to of San Francisco garter snake may include injury or mortality from being crushed by earth moving equipment, construction debris, and worker foot traffic. These impacts would be reduced by minimizing and clearly demarcating the boundaries of the action area and equipment access routes and locating staging areas outside of riparian areas or other water bodies and worker education.

Work activities, including noise and vibration, may harass of San Francisco garter snake by causing them to leave the work area. This disturbance may increase the potential for predation. Minimizing the area disturbed by proposed action activities would reduce the potential for dispersal resulting from the action.

The potential exists for uninformed workers to intentionally or unintentionally harass, injure, harm, or kill a of San Francisco garter snake. The potential for this impact could be greatly reduced by informing workers of the presence and protected status of this species and the measures that are being implemented to protect it during proposed action activities.

Temporary effects from loss of vegetative cover that provides sheltering and foraging habitat for the species would be minimized and compensated for by implementing the proposed restoration actions.

California Freshwater Shrimp

The shrimp adjacent to project sites may be incidentally taken in the form of harm, harassment injury, or mortality as a result of temporary disturbances from project activities. With implementation of the conservation measures, only low levels of injury or mortality of shrimp are anticipated. Injury or mortality to shrimp was not incurred or documented in any of the salmonid or shrimp surveys conducted in the Russian River basin. While the identification of habitat, net capture and release that will be conducted under this Program will result in the low likelihood of injury or mortality to shrimp, it is unreasonable to assume that injury or mortality will never occur. The potential for take in the restoration technique in a project area is higher. In addition, injury to or mortality of shrimp during a dewatering rescue and relocation is more likely due to their fragile size and requirement for an aquatic environment.

Work in live streams or in floodplains could cause unusually high levels of siltation downstream. Although shrimp are usually able to survive in poor water quality conditions, this siltation could alter the quality of the habitat. Siltation also could fill slow-moving pools, reducing the extent or quality of shrimp habitat near the project area. Implementing best management practices for erosion control and reducing the area to be disturbed to the minimum necessary should decrease the amount of sediment that is washed downstream as a result of project activities. Implementation of projects under the Corps' proposed authorization may result in the loss of shrimp habitat. Installation of check dams, rock weirs, log weirs and wing deflectors may prevent shrimp from dispersing along streambanks. The potential for this effect may be reduced by ensuring that project proponents are thoroughly briefed by CDFW on the locations of shrimp streams, by designing projects to match the historical stream ecosystem as closely as possible, and by ensuring that check dams and weirs do not span any creek known to support shrimp.

Many activities in this Program will benefit the California freshwater shrimp. Riparian plantings and cattle exclusion fences will improve habitat quality in California freshwater shrimp streams and their tributaries. Increased riparian cover will increase habitat complexity and root density on streambanks. Riparian vegetation will allow shrimp to disperse more easily and will stabilize water temperatures in the creeks. Exclusionary fencing will reduce cattle impacts to the creek such as overgrazing, streambank trampling, and soil compaction. An increase in sinuosity, side channels, , and an increase in channel complexity will reduce erosion, incision of habitat and sedimentation of downstream reaches. Objectives in the shrimp's recovery plan includes protection of existing populations, removal of threats to these populations, and enhancement of habitat for native aquatic species within the shrimp's historic range. Projects performed under the Restoration Program will aid in the implementation of these recovery objectives.

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. During this consultation, the Service did not identify any future non-federal actions that are reasonably certain to occur in the action area of the proposed project.

Conclusion

After reviewing the current status of California red-legged frog, San Francisco garter snake, and California freshwater shrimp, the environmental baseline for the action area, the effects of the proposed California Department of Fish and Wildlife (CDFW) Fisheries Restoration Grant Program, and the cumulative effects, it is the Service's biological opinion that the California Department of Fish and Wildlife (CDFW) Fisheries Restoration Grant Program, as proposed, is not likely to jeopardize the continued existence of the California red-legged frog, San Francisco garter snake, and California freshwater shrimp. The Service reached this conclusion because the project-related effects to the species, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding recovery or reducing the likelihood of survival of the species based on the following:

1. The Corps and the CDFW have proposed measures to minimize the potential adverse effects of project activities on the California red-legged frog, San Francisco garter snake, and California freshwater shrimp;

2. The persistence of the shrimp and red-legged frog in the affected area would not be diminished by the activities covered under this programmatic consultation;

3. Few, if any, California red-legged frog, San Francisco garter snake, and California freshwater shrimp are likely to be killed or injured during project activities; and

4. The overall quality of California red-legged frog, San Francisco garter snake, and California freshwater shrimp breeding, foraging, and dispersal habitat would be improved as a result of improved water quality, reduced sedimentation, and habitat enhancement associated with Program projects. This improvement would offset any injury or mortality that might result from implementation of Program activities.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by regulations at 50 CFR 17.3 as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the same regulations as an act which actually kills or injures wildlife. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Corps so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Corps must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

Amount or Extent of Take

The amount and extent of take will quantified and exempted with each Appendage of this Programmatic Biological Opinion and is not exempted prior to appendage.

Reasonable and Prudent Measures

The Service has determined that the following reasonable and prudent measure is necessary and appropriate to minimize impacts of incidental take of the California red-legged frog, San Francisco garter snake, and California freshwater shrimp:

1. The Corps will minimize effects to the California red-legged frog, San Francisco garter snake, and California freshwater shrimp and their habitat resulting from project related activities by following this biological opinion and the Programmatic Biological Opinion as modified by the terms and conditions below.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Corps must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are nondiscretionary.

1. 2010 4th edition California Salmonid Stream Habitat Restoration Manual shall be available and accessible to all grantees;

2. The permittee, CDFW, shall fully implement all the Conservation Measures as described in this biological opinion and the Programmatic Biological Opinion;

3. The permittee, CDFW, shall report all take to not exempted by the appendage to the Biological Opinion to Leif Goude (leif_goude@fws.gov) or Ryan Olah (ryan_olah@fws.gov), at the letterhead address, (916) 414-6659 or by e-mail.

4. CDFW will provide post construction monitoring, reporting, and tracking on an annual basis that will describe all work that was completed and document work areas after construction is complete. All audits of grantees by CDFW will also be provided to the Service.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends the following actions:

1. To avoid transferring disease or pathogens while handling amphibians, the Corps should encourage all applicants to follow the Declining Amphibian Populations Task Force Fieldwork Code of Practice.

2. Sightings of any listed or sensitive animal species should be reported to CDFW's CNDDB. A copy of the reporting form and a topographic map clearly marked with the location the animals were observed should also be provided to the Service

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

REINITIATION—CLOSING STATEMENT

This concludes formal consultation on the California Department of Fish and Wildlife Fisheries Restoration Grant Program. As provided in 50 CFR §402.16, reinitiation of formal consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and:

(a) If the amount or extent of taking specified in the incidental take statement is exceeded;

(b) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;

(c) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or

(d) If a new species is listed or critical habitat designated that may be affected by the identified action.

If you have any questions regarding this biological opinion, please contact Leif Goude (leif_goude@fws.gov) or Ryan Olah (ryan_olah@fws.gov), at the letterhead address, (916) 414-6659 or by e-mail.

Sincerely,

Jennifer M. Norris
Field Supervisor

Enclosures:

cc:
Karen Carpio, California Department of Fish and Wildlife, Sacramento California

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