FINAL ENVIRONMENTAL ASSESSMENT

SANTA CLARA CONDUIT MAINTENANCE AND REPAIRS

Appendix D
U.S. Fish and Wildlife Service Biological Opinion

February 2011

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
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In Reply Refer To:
81420-2010-F-1010

February 3, 2011

Memorandum

To: Assistant Director, Bureau of Reclamation, South-Central California Office, Fresno, California (Attention: David E. Hyatt)

From: ~~Field~~ FOR Supervisor, Sacramento Fish and Wildlife Office, Sacramento, California

Subject: Biological Opinion on the Pacheco and Santa Clara Conduits/Tunnels Pipeline Maintenance Program

This is in response to the U.S. Bureau of Reclamation (Reclamation) December 28, 2010, letter requesting consultation with the U.S. Fish and Wildlife Service (Service) on the Pacheco and Santa Clara Conduits/Tunnels Pipeline Maintenance Program. Your request was received in our field office on December 29, 2010. This document represents the Service's biological opinion on the effects of this action on the threatened California red-legged frog (*Rana draytonii*), and the threatened Central California Distinct Population Segment of the California tiger salamander (*Ambystoma californiense*) and its critical habitat. This document is written in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq*) (Act).

The Service has determined that the proposed action may affect, but is not likely to adversely affect the endangered San Joaquin kit fox (*Vulpes macrotis mutica*). There is suitable habitat for this listed canid and there are records of it in the vicinity of the action area (California Department of Fish and Game 2011). The effects of the proposed project on this species are insignificant and discountable because 1) the proposed action will not involve ground excavation; 2) the staging and access will not occur at night which will minimize the effects on this animal; and 3) the proposed conservation measures will avoid and minimize adverse effects.

This biological opinion is based on: (1) *Biological Evaluation: 2011 Santa Clara Conduit Maintenance Project*, dated December 22, 2010; (2) The Pajaro River Watershed Flood Prevention Authority report titled, *Aquatic Ecology and Fisheries of San Felipe Lake*, dated October 31, 2005; (3) a site visit conducted by the Service and other parties on October 13, 2010; (4) Project description and maps provided to the Service by the District; (5) two electronic mail messages from Reclamation to the Service dated February 2, 2011; and (6) other information available to the Service.

Consultation History

September 13, 2010	The Service received a request from Reclamation for technical assistance regarding the proposed Pipeline Maintenance Project via electronic mail
October, 13 2010	The Service participated in a site visit with David Matthews, Thomas Lau, and Nina Merrill from the Santa Clara Valley Water District, and Shauna McDonald, Patricia Clinton, and David Hyatt from Reclamation
December 29, 2010	The Service received a letter from Reclamation regarding the Pipeline Maintenance Project
January 6, 2011	The Service requested and received further information from Reclamation via electronic mail.
February 2, 2011	Recalataion sent two electronic mail messages to the Service describing the acreage containing habitat for the two listed amphibians that would be affected by the proposed project.

BIOLOGICAL OPINION

Description of the Proposed Action

Background

The San Felipe Division of the Central Valley Project encompasses the Santa Clara Valley in Santa Clara County, the northern portion of San Benito County, the southern portion of Santa Cruz County, and the northern edge of Monterey County in California. Water is conveyed from the Delta of the San Joaquin and Sacramento Rivers to O'Neill Forebay. The water is then pumped into San Luis Reservoir and diverted through the Pacheco Tunnel Reach 1 to the Pacheco Pumping Plant. The water flows through the Pacheco Tunnel Reach 2 and through the Pacheco Conduit to the bifurcation of the Santa Clara and Hollister Conduits.

The Santa Clara Conduit became operational in 1988 and conveys water from the Bifurcation Structure to the Coyote Pump Station. The San Felipe Division is owned by Reclamation and maintained by the District. Project work would be in the main pipeline and numerous concrete vaults spread out over its length. Within the vaults, there are line valves, vacuum breakers, air/vacuum release valves, nozzles, turnout tees, blow-off and pump-out valves, bypass valves, flowmeters, chemical injection stations, and other associated piping.

Maintenance and inspection on the two other portions of the Santa Clara Conduit were completed in previous years as part of the Santa Clara Valley Water District's Water Utility Operations Division Asset Management Program.

In early 2009, a separate portion of the Santa Clara Conduit, approximately 9.4 miles in length, was taken out of service. In late 2007, a shorter segment of the Santa Clara Conduit including the Santa Clara Tunnel was also removed from service.

Project Location

The Santa Clara Conduit is located within Santa Clara and San Benito County, California. The maintenance and inspection of the Santa Clara Conduit extends though portions of the cities of Gilroy and Morgan Hill and the Town of San Martin. The extent of the proposed project covers approximately 10.6 miles in addition to the most southerly dewatering point in San Benito County.

Project Description

The purpose of the proposed project is to conduct the following work between the Coyote Pump Station and the Sectionalizing Valve #1:

1. Provide visual and electromagnetic inspection to determine the current condition and stability of the pipeline.
2. Determine if minor internal repairs are needed.
3. Determine if other, more significant internal repairs or pipe section replacements are needed at a later time.
4. Replace seals, bolts, nuts, gaskets, blow-off valves, air release valves, and associated piping.

The project includes the temporary release of untreated water from the Santa Clara Conduit to surrounding percolation ponds and creeks through turnouts, blow-offs and pump-out facilities. One polyjet, two turnouts, four blow-off/pump-outs, and 12 pump-out facilities would be used in the proposed draining sequence. Once the system has been drained pipeline maintenance and inspection of the conduit will be performed. To determine existing conditions staff from the Santa Clara Valley Water District will enter the pipeline to perform a visual assessment and electromagnetic inspections. The pipelines will be refilled after completion of pipeline appurtenance maintenance, pipeline inspection, and minor internal repairs if required. The following steps involved in the proposed project include:

1. Closing valves at the Bifurcation Structure and at the Coyote Pump Station to isolate the pipeline.
2. Draining the water in the pipeline at the turnouts, blowoffs, and pump-out facilities. Internal pump-outs are required to remove water from low points in the pipeline.
3. Conducting repair and maintenance work on pipeline appurtenances, including vacuum breakers, air/vacuum release valves, blow-off valves, blind flanges, turnout valves, and bypass valves on the sectionalizing valves.
4. Inspecting the pipeline and determining the areas in need of repair.
5. Performing minor internal pipeline repairs as needed. Any major internal pipeline repairs would be investigated and completed at a later time.

6. Verifying completion of the Repair and Maintenance Work.

7. Refilling the pipeline.

8. Restoring minor damage to landscaping, property fixtures (i.e. fences) and roads

The initial pipeline draining of the Santa Clara Conduit must commence in early February after the Department of Water Resources completes a flowmeter installation on the South Bay Aqueduct. The sequencing of these two projects is important, as the South Bay Aqueduct represents the other means by which water from the Delta is imported in to Santa Clara County.

Initial pipeline isolation

Before any pipeline maintenance or inspection can begin, the Santa Clara Conduit will be isolated and raw water deliveries halted. To isolate the pipeline, Santa Clara Valley Water District staff will close the Santa Clara Conduit Line Valve at the Bifurcation Structure. This will isolate the pipeline from the San Luis Reservoir water supply. The San Luis Reservoir will continue to remain active and deliver water to San Benito County. Shutting the line valve at the Coyote Pump Station will isolate the other end of the pipeline.

Pipeline draining

The pipeline draining plan incorporates one polyjet, two turnouts, four blow-off/pump-outs, including one site outside of the project area, and 12 pump-out facilities to dewater the pipeline. Internal pump-outs are also needed to remove standing water from inside the pipeline, after the Santa Clara Valley Water District has isolated the pipeline before the draining activities can begin. The majority of water will be discharged at the Calaveras Fault Crossing Inlet into Pacheco Creek at a rate of 5 cubic feet per second (cfs). This site is outside the active work zone (i.e. the area slated for rehabilitation). However, it is the lowest point on the pipeline and is the best engineered dewatering location. This location has been used as a dewatering point several times this past decade. On the segment of the Santa Clara Conduit between the Coyote Pump Station and the Sectionalizing Valve #1, the three blow-off/pump-out locations that would discharge significant the majority of the water will be as follows:

1. Coyote Pump Station Polyjet at 20 cfs into Coyote Creek

2. Main Ave Turnout at 4 cfs into the Main Avenue Ponds

3. San Pedro Turnout at 3 cfs into the San Pedro Percolation Ponds.

These discharges are more normal operation oriented than project related. The district manages the groundwater basin by routinely directing water to percolation ponds and to creeks for recharge. Gravity flow at the three above referenced locations is the first step in draining the conduit, and represents a majority of the water that will be released. During the conduit draining, the air/vacuum release valves will be opened to allow air to enter into the pipeline. The discharges at the four above referenced locations will be made concurrently to their respective creeks.

At the pump-out facilities, a discharge rate of 2 cfs is necessary for the timely draining of the pipeline. Pump-out facilities require a direct connection of an electric pump, powered by an on-site generator, to a fitting on the pipeline appurtenance. Layflat hose will convey water from the pipeline, through the pump, to the receiving creeks. When the water level in the pipe is low, the vault lids will be unbolted, removed, and a suction hose from the pump would be lowered down inside the pipeline to reach the targeted water. The remaining untreated water in the pipeline will be pumped out to local surface waterways. Discharges are planned to occur simultaneously from two vault locations.

There are several vault locations that are planned for an internal pump-out. If the low point in the pipeline with standing water cannot be easily reached from above, entrance into the pipeline may be necessary. For this case, with confined space rescue support on-site, a District or contracted staff member will carry one end of the suction pipe to the low point in the pipeline with standing water. The other end of the suction pipe is connected to a pump outside of the pipe. Layflat hose will be used to convey the water from inside of the pipe to the nearest receiving creek. Complete drainage of the pipeline is necessary for entry and inspection of the pipeline for defects that need repair. After the drainage is completed, the total volume of removed water will be approximately 98.3 acre-feet. This total includes the referenced "normal operation" component of the dewatering and the discharge at the Calaveras Fault Crossing.

The estimated rates and volumes of the discharged water at each of the draining sites range from 2 to 20 cubic feet second, and 2,412 to 15,218,232 gallons, respectively. Since all of water is from an unaltered source, no pre-treatment or dechlorination is necessary. Fine mesh screens will be used to filter the water prior to discharge in order to minimize the chances of importation of exotic species.

Maintenance, inspection, and internal repairs

Pipeline maintenance will be conducted according to Santa Clara Valley Water District standards. Project plans will be prepared by the District's Utility Programs Support Unit. The pipeline maintenance activities will be done primarily inside the concrete vaults. Blow-off and pump-out valves, vacuum breakers, air/vacuum release valves, ball valves, blind flanges, flowmeters, and other piping will be replaced or repaired at approximately 39 vault locations during the pipeline outage. Representative vaults on the pipeline will be tested for lead in its existing paint and the maintenance contractor will take standard precautions if significant amounts of lead are found. Lead will not be released into the environment.

Refilling

Refilling the conduit after maintenance, inspection, and repair will be conducted in accordance with standard Santa Clara Valley Water District procedures for returning pipelines back into service. District staff and the contractor will seal and bolt up all pipeline openings upon refilling the pipeline, and monitor the refilling process. Any pipeline appurtenances found to be leaking and/or faulty under working pressure will be repaired immediately by the contractor.

Equipment

Major equipment to be used will include:

1. Fans for pipeline ventilation while the inspection team is in the pipeline;
2. Submersible and centrifugal pumps for emptying the pipeline of water;
3. Generators for supplying power to the pumps, fans, and miscellaneous tools;
4. Welding equipment for installing pipeline appurtenances and making internal pipeline repairs;
5. Flat bed truck for transporting equipment and materials;
6. Cargo vans, utility trucks, and pickup trucks for general repair work;
7. Cranes mounted on the back of maintenance trucks may be needed to remove vault lids, replace piping, and place pumps;
8. Other Santa Clara Valley Water District vehicles for transporting personnel and minor parts and supplies.

The contractor will deliver blow-off valves, bolts, nuts, welding materials and all other major equipment and tools to the project site as needed.

Schedule

The project is proposed to be implemented in early February 2011. Approximately eight weeks are planned for the project from the valve isolation to resuming pipeline deliveries and service. Isolation and draining of the pipeline is expected to take three weeks. Maintenance activities on pipeline appurtenances, internal pipeline inspection, and repairs are anticipated to take approximately five weeks. Refilling is expected to last three days. Up to 35 Santa Clara Valley Water District and contracted staff would be required for the project.

Staging and access

Vehicles will access work areas via local highways, streets, and existing access roads where possible. Approximately 0.78 mile of unpaved road will be used for accessing some worksites. Access routes will be limited to a width of 14 feet or less. There are several vaults located in the middle of farms. Project staff and equipment will access work sites by crossing fields. The District would coordinate with the private property owners regarding access through their fields to the vaults. At some work sites, existing fences may need to be temporarily removed to permit access. Interim gates and/or fencing will be installed at some locations to prevent unauthorized entry to the work area. The interim gates will be removed after project completion. If access roads and terrain become unstable due to wet weather conditions, composite mats may be set and used to provide a safe, continuous, solid surface for vehicles on-site. The composite mats are temporary and will be removed at the end of the project.

Staging areas will consist of temporary areas, utilized by the Santa Clara Valley Water District and/or contracted staff, around the approximately 39 vault locations and the outfalls in the receiving creeks. The typical staging and work area will be approximately 40 feet by 40 feet. The anticipated work includes all activities related to the pipeline draining, repair and maintenance, inspection, internal repairs, and refilling. For these activities, the staging areas include temporary storage and use of equipment, materials, supplies, or other incidentals.

Prior to the start of the project, Santa Clara Valley Water District staff may need to perform minor site and road preparation work to gain access and repair vulnerable areas along the pipeline. After the pipeline is refilled and back in service, District and contracted staff will complete any site restoration (i.e. landscaping) and road grading work as needed.

Conservation Measures

Santa Clara Valley Water District staff will implement best management practices (BMPs) and the following avoidance and minimization measures for the proposed discharge of raw water into the creeks. These BMPs and measures will be implemented in accordance with various documents including, but not limited to, the District's 10 -Year Program Environmental Impact Report (PEIR) (adopted November 2007), Service biological opinion (SFWO file number 81420-2009-F-0245), and the National Marine Fisheries Service's not likely to adversely affect letter (file number 2007/05948) that addresses the District's 10-Year program. The 2009 biological opinion from the Service is not specific to the proposed project, but it does address a different portion of the same pipeline and includes some of the same dewatering locations.

Baseline readings will be established for turbidity, temperature, and other water quality parameters. These parameters will be monitored and tracked during the discharge of waters to ensure that they do not exceed targeted ranges. The frequency of the monitoring will be in accordance with the PEIR. If the parameters are outside of the recommended range, adjustments to the discharge will be made such as implementing additional BMPs, decreasing the flow rate, or suspending the discharge. Similar monitoring procedures have been successfully implemented on previous pipeline rehabilitation projects on the San Felipe Division.

The project proponent proposes to avoid and minimize for affects to listed species through the following conservation measures:

1. Vehicles will access the work areas via local streets, highways, and the existing access roads. The routes would be limited a width of 15 feet or less. Personnel will be required to adhere to marked paths. No other off-road travel will be allowed. Burrows potentially occupied by California red-legged frogs or California tiger salamanders will be avoided.
2. Unpaved roadway traffic speed would be limited to 10 miles per hour.
3. Individuals trained in monitoring water levels will observe flows in receiving waters. If it appears that discharges are approaching channel capacity, discharge rates will be reduced. If erosion is evident, flow rates will be reduced.
4. If erosion continues to occur, discharges will be terminated until appropriate erosion control measures are installed. Monitoring of creek conditions will be conducted prior to

the start of discharge and regularly during the discharge. The frequency of monitoring will be dependent upon the nature of the discharge and the erosion in the action areas.

5. Woody material (including live leaning trees, dead trees, tree trunks, large limbs, and stumps) will be retained unless it is threatening a structure or impedes reasonable access, in which case it will be retained on site but relocated to an area where it poses less of a threat.

6. No fueling, repair, cleaning, maintenance, or vehicle washing will be performed at job sites or within 65 feet of a wetland or riparian area.

7. All chemicals stored in staging areas will be stored in secondary containment with no less than 110% capacity. Proper storage and security will be implemented to ensure that chemicals are not spilled or vandalized during non-working hours.

8. No firearms will be allowed on-site, except for Federal, State, local law enforcement, or security guards.

9. No pets will be allowed at the project site.

10. During pipeline draining, wedge wire screens (< 5 millimeters) will be placed over the discharge openings of gravity drain gates and on the suction and discharge piping of any submersible pumps used for pipeline discharge to prevent discharge of non-native species and to prevent entry or entrapment of California red-legged frogs or California tiger salamanders.

11. A survey for California red-legged frogs and California tiger salamanders will be conducted in the receiving water body by a Service-approved biologist one week prior to water release, within 500 feet upstream and downstream of the release point. Absence will be re-verified within 24 hours prior to commencement of water release. Release may commence if no adult California red-legged frogs and California tiger salamanders, and their eggs or larvae are found within 500 feet upstream or downstream of the release point during the second survey. If adults, eggs, or larvae are found within 100 feet downstream of a release point, the discharge point will not be utilized. If found within 200-500 feet of the release point, velocity reduction, accomplished by either slowing release, decreasing release volume, and/or applying dissipation, will be implemented to minimize effects to these listed species.

12. Access and staging in areas with no surfacing or prior establishment will be surveyed to avoid serpentine areas and special status plants. A 100-foot buffer zone will be temporarily marked for avoidance. Upon project completion, all temporary markers will be removed and properly disposed of.

13. Forty-eight hours prior to the start of work activities, the entire project action areas will be surveyed by a Service-approved biologist for California red-legged frogs, California tiger salamanders, and San Joaquin kit foxes.

14. If any life stage of these animals is observed, the Service-approved biologist will immediately be notified and will follow the protocol outlined in measure 16.

15. Prior to the start of work activities, a Service-approved biologist will conduct a training session for all work personnel. Training will include a description of the California red-legged frogs, the California tiger salamander, and the San Joaquin kit fox, their respective habitats, and proper procedures in the event that any individuals are detected within the project action area. Photographs of the California red-legged frog, the California tiger salamander, and the San Joaquin kit fox will be distributed to all workers and contractors as a part of this training.

16. The Service-approved biologist will survey for California tiger salamander, California red-legged frog, and San Joaquin kit fox on the morning before the start of daily work. If a California red-legged frog, California tiger salamander or San Joaquin kit fox, or any animal that work personnel believes may be one of these species, is encountered during project work, the following protocol shall be followed:

    a. All work that could result in direct injury, disturbance, or harassment of the individual animal will immediately cease.

    b. The foreman and Service-approved biologist will be immediately notified.

    c. The Service-approved biologist will immediately notify the Service and the California Department of Fish and Game via telephone or electronic mail when any federally listed species are encountered and may be danger of harm.

        1. If at any time a California red-legged frog or California tiger salamander is discovered in the work area by the Service-approved biologist or workers including during pre-activity surveys, the Service-approved biologist will relocate the animal to a safe location outside the exclusion barrier in an area that would remain undisturbed throughout the project following the proper handling protocol.

        2. If a San Joaquin kit fox is discovered in the work area, it would be allowed to leave the site on its own.

        3. California red-legged frogs and California tiger salamanders will be translocated to appropriate habitat for its current life stage.

        4. The Service-approved biologist will monitor any translocated animal until it is determined that it is not in danger from predators or subject to further harm.

17. All litter and work debris will be disposed of offsite in accordance with State and local regulations. All trash and debris within the work area will be placed in containers with secure lids before the end of each work day in order reduce the likelihood of predators being attracted to the site by trash that may be left on-site. If containers meeting these criteria are not available, all trash will be removed from the project site at the end of each work day.

18. The introduction and/or spread of invasive animal and plant species will be avoided to the maximum extent practicable.

19. Animal exclusion fencing will be erected and maintained all around work areas that are off-road. Installation of the fence will be performed under the supervision of a Service-approved biologist. Fencing will be made of reinforced plastic or plywood and would be buried a minimum of six inches into the ground. Animal exclusion fencing will be checked daily by work personnel trained by a Service-approved biologist to identify weaknesses. All compromised portions will be repaired and/or replaced immediately.

20. Plastic mono-filament netting (erosion control matting), rolled erosion control products or similar material shall not be used at the project site because California red-legged frogs, California tiger salamanders, or other species may become entangled or trapped in it.

21. Tightly woven fiber netting, such as coconut fiber or similar material will be used for erosion control or other purposes at the project to ensure that California red-legged frogs and California tiger salamanders do not become entangled and trapped. This limitation will be communicated to the contractor through use of Special Provisions included in the bid solicitation package.

22. California red-legged frogs and California tiger salamanders may take refuge in cavity-like and den-like structures such as pipes and may enter stored pipes and become trapped. Therefore, all pipes, culverts, or similar structures that are stored at a work site for one or more overnight periods will be either securely capped prior to storage and thoroughly inspected by the Service-approved biologist and the work foreman for any animals before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a California red-legged frog or California tiger salamander is discovered inside a pipe by the Service-approved biologist or anyone else, the protocol outlined in conservation measure 14 would be followed and the Service-approved biologist will relocate the animal to a safe nearby location (or, in the case of a kit fox, allow it to leave on its own) and monitor it until it is determined that it is not imperiled by predators or other dangers.

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 purposes of the effects assessment, action area includes the project footprint around the Santa Clara Conduit itself, access, including maintained access roads, and streams and associated banks and riparian vegetation that the conduit crosses and/or discharges into.

Status of the Species

California red-legged frog

The California red-legged frog was listed as a threatened species on May 23, 1996 (Service 1996). Critical habitat for the species was designated on April 13, 2006 (Service 2006).

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; the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 2003), and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 0.6 to 3.1 inches in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

California red-legged frogs have paired vocal sacs and vocalize in air (Hayes and Krempels 1986). They breed from November through March with earlier breeding records occurring in southern localities (Storer 1925). Female frogs deposit egg masses on emergent vegetation so that the egg mass floats on the surface of the water (Hayes and Miyamoto 1984). Individuals occurring in coastal drainages are active year-round (Jennings *et al.* 1992), whereas those found in interior sites are normally less active during the cold season.

Adult California red-legged frogs typically use dense, shrubby, or emergent riparian vegetation closely associated with deep (2.3 feet), still, or slow-moving water (Hayes and Jennings 1988). However, individuals also have been found in ephemeral creeks and drainages and in ponds that may or may not have riparian vegetation. The largest densities of red-legged frogs currently are associated with deep pools with dense stands of overhanging willows and an intermixed fringe of cattails (Jennings 1988). California red-legged frogs disperse upstream and downstream of their breeding habitat to forage and seek sheltering habitat.

During other parts of the year, habitat for the California red-legged frog 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 bush, 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 animals have been found in a 6-foot wide coyote bush thicket growing along a tiny 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 sheds, or hay stacks may also be used. Incised stream channels with portions narrower and depths greater than 18 inches also may provide important summer sheltering habitat. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting population numbers and survival.

Adult California red-legged frogs are often associated with permanent bodies of water. However, while many individuals remain at permanent breeding ponds year-round, Fellers and Kleeman (2007) found that nearly half of all females in certain populations disperse away from these areas into other suitable non-breeding locations. Once at these areas, they may remain there for the majority of the year, retuning to breeding ponds for only several weeks at a time. While California red-legged frogs do not have a distinct breeding migration back to these breeding areas, the number of dispersing individuals appears to increase with rainfall (Fellers 2005; Fellers and Kleeman 2007). Dispersal distances to and from breeding habitat are typically less than 0.5 mile, with a few individuals moving up to 1-2 miles (Fellers 2005; Fellers and Kleeman 2007; and Tatarian 2009).

Movements are typically along riparian corridors; however dispersal from breeding habitats to riparian areas often requires California red-legged frogs to traverse across less desirable habitats such as open fields where grazing, farming or other high intensity management activities may occur (Fellers and Kleeman 2007). Dispersing animals 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). Because of the ability of California red-legged frogs to move through a range of different habitats as well as the life history needs required by this species, equal protection of suitable breeding and non-breeding areas as well as the migration corridors that connect them is vital to the recovery and survival of the species (Fellers and Kleeman 2007).

Egg masses of the California red-legged frog contain about 2,000 to 5,000 moderate sized (0.08 to 0.11 inches in diameter), dark reddish brown eggs and are typically attached to vertical emergent vegetation, such as bulrushes or cattails (Jennings *et al.* 1992). This species is a prolific breeder, laying its eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Eggs hatch in 6 to 14 days (Jennings 1988). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis 3.5 to 7 months after hatching (Storer 1925; Wright and Wright 1949; Jennings and Hayes 1990). Of the various life stages, larvae probably experience the highest mortality rates, with less than 1% of eggs laid reaching metamorphosis (Jennings *et al.* 1992). Sexual maturity normally is reached at 3 to 4 years of age (Storer 1925; Jennings and Hayes 1985). California red-legged frogs may live 8 to 10 years (Jennings *et al.* 1992). The populations of this species fluctuate in size from year to year. When conditions are favorable the species can have extremely high rates of reproduction and thus produce large numbers of dispersing young and a concomitant increase in the number of occupied sites. In contrast, California red-legged frogs may temporarily disappear from an area when conditions are stressful, such as during droughts. At these locations, the rare individuals that disperse over long distances via riparian and overland corridors become necessary to repopulate temporarily abandoned but still suitable regions (Fellers and Kleeman 2007).

The diet of the California red-legged frog is highly variable. Hayes and Tennant (1985) found invertebrates to be the most common food items. According to their data, vertebrates, such as Pacific tree frogs and California field mice, represent over half the prey mass eaten by larger frogs, although invertebrates were the most numerous food items (Service 2002). Adult California red-legged frogs have been known to eat threatened California tiger salamanders larvae (Shaffer *et al.* 2004). Hayes and Tennant (1985) found juveniles to be active during the day and night, whereas adults were largely nocturnal. Adult California red-legged frogs have often been observed spending daylight hours taking shelter in still pools and associated vegetation or thermoregulating in full sunlight on rocks or other highly exposed surfaces (Fellers and Kleeman 2007). Feeding activity probably occurs along the shoreline and on the surface of the water (Hayes and Tennant 1985). The diet of California red-legged frog tadpoles is not well studied, but their diet is probably similar to other ranid tadpoles that feed on algae, diatoms, and detritus by grazing on the surface of rocks and vegetation (Jennings *et al.* 1992; Kupferberg 1996; Fellers 2005).

The historic range of the California red-legged frog extended coastally from the vicinity of Point Arena in Mendocino County, California, and inland from the vicinity of Redding in Shasta County, California, southward to northwestern Baja California, Mexico (Jennings and Hayes 1985; Hayes and Krempels 1986). It historically was known from 46 counties in California but is currently only found in 22 of them (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, and northern Transverse Ranges. The species is believed to be extirpated from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico.

Habitat loss and alteration, over-exploitation, and introduction of exotic predators were significant factors in the species' decline in the early to mid-1900s. Agriculture, urbanization, mining, overgrazing, recreation, timber harvest, nonnative plants, impoundments, water diversions, degraded water quality, and introduced predators have resulted in substantial degradation and loss of California red-legged frog breeding ponds, upland habitat, and dispersal corridors. These factors have resulted in the isolation and fragmentation of habitats within many watersheds, often precluding dispersal between sub-populations and jeopardizing the viability of metapopulations (broadly defined as multiple subpopulations that occasionally exchange individuals through dispersal, and are able to "rescue" small populations and colonize available empty habitat patches). The fragmentation of existing habitat and the continued colonization of existing habitats by nonnative species may represent the most significant current threats to red-legged frogs.

The urbanization of land within and adjacent to California red-legged frog habitat has also impacted this species. 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. The conversion and isolation of perennial pool habitats resulting from urbanization is also an ongoing impact to red-legged frogs.

Global climate change may contribute to the loss of habitat for the California red-legged frog. The increasing discrepancies in seasonal temperature and precipitation variations will produce deeper rivers with higher velocities in the spring and reduced aquatic habitat with higher eutrophication rates during the summer. The consequence of these changes will likely contribute to the increasing decline in California red-legged frog breeding habitat throughout California.

Some current habitat loss has been compensated in developed areas through artificially created habitat such as golf courses or restoration ponds. Both juvenile and adult California red-legged frogs have been found in these human-created habitats. However, habitat created near urban areas where predators such as American bullfrogs and raccoons are able to increase in population size may not be suitable for the long-term survival or successful reproduction of local frog populations (Fellers and Kleeman 2007). Other factors such as contaminants and lack of dispersal corridors connecting habitat patches may also prevent long-term survival of populations in created habitat patches (Davidson *et al.* 2001; Sparling *et al.* 2001; Fellers and Kleeman 2007).

California red-legged frog populations are further threatened by emerging infectious diseases. Pounds *et al.* (2006) discussed dramatic increases in fatalities of ranid populations worldwide due to outbreaks associated with a chytrid fungus, *Batrachochytrium dendrobatidis* (Bd). These outbreaks are thought to be associated with rapid global climate change, which creates climatic conditions that are more favorable to the fungus (Pounds *et al.* 2006). Bd has been identified in the San Francisco Bay area and further research is currently underway to determine the extent and impact of these outbreaks. Mao *et al.* (1999 cited in Fellers 2005) reported northern red-legged frogs infected with an iridovirus, a pathogen that was also detected in sympatric three-spined sticklebacks in northwestern California.

Predation by introduced species is also a significant threat to the red-legged frog. Several researchers in central California have noted the decline and eventual local disappearance of California red-legged frogs and northern red-legged frogs once bullfrogs became established at the same sites (Jennings and Hayes 1990; Twedt 1993). This has been attributed to both predation and competition. Twedt (1993) documented bullfrog predation of juvenile northern red-legged frogs, and suggested that bullfrogs could prey on subadult northern red-legged frogs as well. In addition to predation, bullfrogs may have a competitive advantage over California red-legged frogs, since bullfrogs are larger, possess more generalized food habits (Bury and Whelan 1984), have an extended breeding season (Storer 1933) during which an individual female can produce as many as 20,000 eggs (Emlen 1977), and larvae are unpalatable to predatory fish (Kruse and Francis 1977). Thus, bullfrogs may be able to prey upon and out-compete California red-legged frogs, especially in sub-optimal habitat.

In addition to the adverse effects of competition and predation, bullfrogs interfere with California red-legged frog reproduction. Both California red-legged frogs and northern red-legged frogs have been observed in amplexus with (mounted on) both male and female bullfrogs (Jennings and Hayes 1990; Twedt 1993; and D'Amore *et al.* 2009). Wasted reproductive efforts resulting from mating attempts between biologically incompatible species such as California red-legged frogs and bullfrogs can result in declining populations of the native species (D'Amore *et al.* 2009).

Red swamp crayfish, signal crayfish, and several species of warm water fish including sunfish, goldfish, common carp, and mosquitofish may similarly affect red-legged frogs through predation and competition (Lawler *et al.* 1999).

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

California Tiger Salamander

On May 23, 2003, the Service proposed to list the Central California Distinct Population Segment of the California tiger salamander as threatened. At this time we also proposed reclassification of the Santa Barbara County Distinct Population Segment Distinct Population Segment and Sonoma County from endangered to threatened (68 FR 28647). In the same notice a proposed special rule under section 4(d) of the Act was included that would exempt take for routine ranching operations for the Central California Distinct Population Segment and, if reclassified to threatened, for the Santa Barbara and Sonoma County (68 FR 28668). On August 4, 2004, after determining that the listed the Central California population of the California Distinct Population Segment of the California tiger salamander was threatened (69 FR 47211), it was determined that the Santa Barbara population and Sonoma County population were threatened, and reclassified the California tiger salamander as threatened throughout its range (69 FR 47211), removing the Santa Barbara and Sonoma County populations as separately listed Distinct Population Segments (69 FR 47241). This notice finalized the special rule to exempt take for routine ranching operations for the California tiger salamander throughout its range (69 FR 47248).

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

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

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

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

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

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

California tiger salamanders typically emerge from their underground refugia at night during the fall or winter rainy season (November-May) to migrate to their breeding ponds (Stebbins 1989, 2003; Shaffer et al. 1993; Trenham *et al.* 2000). The breeding period is closely associated with the rainfall patterns in any given year with less adults migrating and breeding in drought years (Loredo and Van Vuren 1996; Trenham *et al.* 2000). Males are typically first to arrive and generally remain in the ponds longer than females. Results from a 7-year study in Monterey County suggested that males remained in the breeding ponds for an average of 44.7 days while females remained for an average of only 11.8 days (Trenham *et al.* 2000). Historically, breeding ponds were likely limited to vernal pools, but now include livestock stock ponds. Ideal breeding ponds are typically fishless, and seasonal or semi-permanent (Barry and Shaffer 1994; Petranka 1998).

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

California tiger salamander larvae typically hatch within 10 to 24 days after eggs are laid (Storer 1925). The peak emergence of these metamorphs is typically between mid-June and mid-July (Loredo and Van Vuren 1996; Trenham *et al.* 2000). The larvae are totally aquatic and range in length from approximately 0.45 to 0.56 inches (Petranka 1998). They have yellowish gray bodies, broad fat heads, large, feathery external gills, and broad dorsal fins that extend well up their back. The larvae feed on zooplankton, small crustaceans, and aquatic insects for about six weeks after hatching, after which they switch to larger prey (J. Anderson 1968). Larger larvae have been known to consume the tadpoles of Pacific treefrogs, western spadefoot toads, and California red-legged frogs (J. Anderson 1968; P. Anderson 1968). California tiger salamander larvae are among the top aquatic predators in seasonal pool ecosystems. When not feeding, they often rest on the bottom in shallow water but are also found throughout the water column in deeper water. Young salamanders are wary and typically escape into vegetation at the bottom of the pool when approached by potential predators (Storer 1925).

The California tiger salamander larval stage is typically completed in 3 to 6 months with most metamorphs entering upland habitat during the summer (Petranka 1998). In order to be successful, the aquatic phase of this species' life history must correspond with the persistence of its seasonal aquatic habitat. Most seasonal ponds and pools dry up completely during the summer. Amphibian larvae must grow to a critical minimum body size before they can metamorphose (change into a different physical form) to the terrestrial stage (Wilbur and Collins 1973).

Larval development and metamorphosis can vary and is often site-dependent. Larvae collected near Stockton in the Central Valley during April varied between 1.88 to 2.32 inches in length (Storer 1925). Feaver (1971) found that larvae metamorphosed and left breeding pools 60 to 94 days after eggs had been laid, with larvae developing faster in smaller, more rapidly drying pools. Longer ponding duration typically results in larger larvae and metamorphosed juveniles that are more likely to survive and reproduce (Pechmann *et al.* 1989; Semlitsch et al. 1988; Morey 1998; Trenham 1998b). Larvae will perish if a breeding pond dries before metamorphosis is complete (P. Anderson 1968; Feaver 1971). Pechmann et al. (1988) found a strong positive correlation between ponding duration and total number of metamorphosing juveniles in five salamander species. In Madera County, Feaver (1971) found that only 11 of 30 sampled pools supported larval California tiger salamanders, and 5 of these dried before metamorphosis could occur. Therefore, out of the original 30 pools, only 6 (20 percent) provided suitable conditions for successful reproduction that year. Size at metamorphosis is positively correlated with stored body fat and survival of juvenile amphibians, and negatively correlated with age at first reproduction (Semlitsch *et al.* 1988; Scott 1994; Morey 1998).

Following metamorphosis, juveniles leave their pools and enter upland habitat. This emigration can occur in both wet and dry conditions (Loredo and Van Vuren 1996; Loredo *et al.* 1996). Wet conditions are more favorable for upland travel but rare summer rain events seldom occur as metamorphosis is completed and ponds begin to dry. As a result, juveniles may be forced to leave their ponds on rainless nights. Under dry conditions, juveniles may be limited to seeking upland refugia in close proximity to their aquatic larval pool. These individuals often wait until the next winter's rains to move further into more suitable upland refugia.

Although likely rare, larvae may over-summer in permanent ponds. Juveniles remain active in their upland habitat, emerging from underground refugia during rainfall events to disperse or forage (Trenham and Shaffer 2005). Depending on location and other development factors, metamorphs will not return as adults to aquatic breeding habitat for 2 to 5 years (Loredo and Van Vuren 1996; Trenham *et al.* 2000).

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

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

California tiger salamanders are known to travel large distances between breeding ponds and their upland refugia. Generally it is difficult to establish the maximum distances traveled by any species, but California tiger salamanders in Santa Barbara County have been recorded dispersing up to 1.3 miles from their breeding ponds (Sweet 1998). They also are known to travel between breeding ponds. One study found that 20 to 25 percent of the individuals captured at one pond were recaptured later at other ponds approximately 1,900 feet and 2,200 feet away (Trenham *et al.* 2001). In addition to traveling long distances during juvenile dispersal and adult migration, California tiger salamanders may reside in burrows far from their associated breeding ponds.

Although previously cited information indicates that California tiger salamanders can travel long distances, they typically remain close to their associated breeding ponds. A trapping study conducted in Solano County during the winter of 2002/2003 suggested that juveniles dispersed and used upland habitats further from breeding ponds than adults (Trenham and Shaffer 2005). More juvenile salamanders were captured at traps placed at 328, 656, and 1,312 feet from a breeding pond than at 164 feet. Approximately 20 percent of the captured juveniles were found at least 1,312 feet from the nearest breeding pond.

The associated distribution curve suggested that 95 percent of juvenile salamanders were within 2,099 feet of the pond, with the remaining 5 percent being found at even greater distances. Preliminary results from the 2003-04 trapping efforts at the same study site detected juvenile tiger salamanders at even further distances, with a large proportion of the captures at 2,297 feet from the breeding pond (Trenham *et al.* 2000). Surprisingly, most juveniles captured, even those at 2,100 feet, were still moving away from ponds (Ben Fitzpatrick, University of California at Davis, personal communication, 2004). In Santa Barbara County, juvenile California tiger salamanders have been trapped approximately 1,200 feet away while dispersing from their natal pond (Science Applications International Corporation, unpublished data). These data show that many California tiger salamanders travel far while still in the juvenile stage. Post-breeding movements away from breeding ponds by adults appear to be much smaller. During post-breeding emigration from aquatic habitat, radio-equipped adult California tiger salamanders were tracked to burrows between 62 feet to 813 feet from their breeding ponds (Trenham 2001). These reduced movements may be due to adult California tiger salamanders exiting the ponds with depleted physical reserves, or drier weather conditions typically associated with the post-breeding upland migration period.

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

Documented or potential California tiger salamander predators include coyotes, raccoons, striped skunks, opossums, egrets, great blue herons, crows, ravens, garter snakes, bullfrogs, California red-legged frogs, mosquito fish, and crayfish.

The California tiger salamander is imperiled throughout its range due to a variety of human activities (Service 2004). Current factors associated with declining California tiger salamander populations include continued habitat loss and degradation due to agriculture and urbanization; hybridization with the non-native barred tiger salamander (*Ambystoma tigrinum malvortium*) (Fitzpatrick and Shaffer 2004; Riley *et al.* 2003); and predation by introduced species. California tiger salamander populations are likely threatened by multiple factors but continued habitat fragmentation and colonization of non-native salamanders may represent the most significant current threats.

Habitat isolation and fragmentation within many watersheds have precluded dispersal between sub-populations and jeopardized the viability of metapopulations (broadly defined as multiple subpopulations that occasionally exchange individuals through dispersal, and are capable of colonizing or "rescuing" extinct habitat patches).

Other threats include disease, predation, interspecific competition, urbanization and population growth, exposure to contaminants, rodent and mosquito control, road-crossing mortality, and hybridization with non-native salamanders. Currently, these various primary and secondary threats are largely not being offset by existing federal, state, or local regulatory mechanisms. The California tiger salamander is also prone to chance environmental or demographic events, to which small populations are particularly vulnerable.

Thirty-one percent (221 of 711 records and occurrences) of the Central Valley Distinct Population Segment California tiger salamander records and occurrences are located in Alameda, Santa Clara, San Benito (excluding the extreme western end of the County), southwestern San Joaquin, western Stanislaus, western Merced, and southeastern San Mateo counties. Of these counties, most of the records are from eastern Alameda and Santa Clara counties (California Department of Fish and Game 2009; Service 2004). The California Department of Fish and Game (2009) now considers 13 of these records from the Bay Area region as extirpated or likely to be extirpated.

Due to the extensive losses of vernal pool complexes and their limited distribution in the Bay Area region, many California tiger salamander breeding sites consist of artificial water bodies. Overall, 89 percent (124) of the identified water bodies are stock, farm, or berm ponds used by cattle grazing and/or as a temporary water source for small farm irrigation (California Department of Fish and Game 2009). This places the California tiger salamander at great risk of hybridization with the non-native barred tiger salamander. Without long-term maintenance, the longevity of artificial breeding habitats is uncertain relative to naturally occurring vernal pools that are dependent on the continuation of seasonal weather patterns (Shaffer 2003).

California tiger salamander critical habitat

Critical habitat is defined in Section 3 of the Act as: (1) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. In determining which areas to designate as critical habitat, the Service considers those physical and biological features that are essential to a species' conservation and that may require special management considerations or protection (50 CFR 424.12(b)).

The Service is required to list the known primary constituent elements together with the critical habitat description. Such physical and biological features include, but are not limited to, the following: 1) Space for individual and population growth, and for normal behavior; 2) Food, water, air, light, minerals, or other nutritional or physiological requirements; 3) Cover or shelter; 4) Sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and 5) Generally, habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

Critical habitat for the Central California Distinct Population Segment of the California tiger salamander was designated on August 23, 2005 in 19 counties for the Central Valley population and is divided into four geographic regions: (1) Central Valley Region; (2) Southern San Joaquin Region; (3) East Bay Region; and (4) Central Coast Region (Service 2005a). The rule identifies approximately 199,109 acres within 32 critical habitat units (Service 2005a).

The primary constituent elements for the tiger salamander are based on our current knowledge of the life history, biology, and ecology of the species and the relationship of its essential life history functions to its habitat, we have determined that the Central California Distinct Population Segment of the California tiger salamander requires the following primary constituent elements: (1) Standing bodies of fresh water including natural and manmade (e.g., stock) ponds, vernal pools, and other ephemeral or permanent water bodies which typically support inundation during winter rains and hold water for a minimum of 12 weeks in a year of average rainfall; (2) Upland habitats adjacent and accessible to breeding ponds that contain small mammal burrows or other underground habitat that California tiger salamanders depend upon for food, shelter, and protection from the elements and predation; and (3) Accessible upland dispersal habitat between occupied locations that allow for movement between such sites.

Primary Constituent Element 1: The requisite aquatic habitat described as the first PCE is essential for the Central California Distinct Population Segment of the California tiger salamander for providing space, food, and cover necessary to support reproduction and to sustain early life history stages of larval and juveniles. Aquatic and breeding habitats consist of fresh water bodies, including natural and artificially made (e.g., stock) ponds, vernal pools, and vernal pool complexes. To be considered essential, aquatic and breeding habitats must have the capability to hold water for a minimum of 12 weeks in the winter or spring in a year of average rainfall, the amount of time needed for to metamorphose into juveniles capable of surviving in upland habitats. During periods of drought or less-than-average rainfall, these sites may not hold water long enough for individuals to complete metamorphosis; however, these sites would still be considered essential because they constitute breeding habitat in years of average rainfall.

Primary Constituent Element 2: Essential upland habitats containing underground refugia described as the second PCE are essential for the survival of the Central California Distinct Population Segment's adult California tiger salamanders and juveniles that have recently undergone metamorphosis. Adult and juveniles are primarily terrestrial; adults enter aquatic habitats only for relatively short periods of time to breed. For the majority of their life cycle, California tiger salamanders survive within upland habitats containing underground refugia in the form of small mammal burrows. The California tiger salamander cannot persist without upland underground refugia. These underground refugia provide protection from the hot, dry weather typical of California in the non-breeding season. This species also forages in the small mammal burrows and rely on the burrows for protection from predators. The presence of small burrowing mammal populations is essential for constructing and maintaining burrows. Without the continuing presence of small mammal burrows in upland habitats, the California tiger salamander is not be able to survive.

Primary Constituent Element 3: The dispersal habitats described as the third PCE are essential for the conservation of the Central California Distinct Population Segment of the California tiger salamander. Protecting the ability of the species to move freely across the landscape in search of suitable aquatic and upland habitats is essential in maintaining gene flow, recolonization, and population structure. Movement between areas containing suitable upland and aquatic habitats (i.e., dispersal) is restricted due to inhospitable conditions around and between areas of suitable habitats. Because many of the areas of suitable habitats may be small and support small numbers of salamanders, local extinction of these small units may be common.

Essential dispersal habitats generally consist of upland areas adjacent to essential aquatic habitats that are not isolated from essential aquatic habitats by barriers that California tiger salamanders cannot cross. Essential dispersal habitats provide connectivity among suitable aquatic and upland habitats. While the California tiger salamanders can bypass many obstacles, and do not require a particular type of habitat for dispersal, the habitats connecting essential aquatic and upland habitats need to be free of barriers (e.g., a physical or biological feature that prevents salamanders from dispersing beyond the feature) to function effectively. Examples of barriers are areas of steep topography devoid of soil or vegetation. Agricultural lands such as row crops, orchards, vineyards, and pastures do not constitute barriers to the dispersal of California tiger salamander.

The proposed project is located within the East Bay Geographic Region, which covers portions of Alameda County, south to Santa Benito and Santa Clara counties, and west to the eastern portions of San Joaquin and Merced Counties. The East Bay Region includes 14 critical habitat units totaling approximately 68,873 acres. The 14 critical habitat units within the East Bay Region occur in the Livermore, Central Coast, and San Joaquin vernal pool regions. Special management requirements for these units include management of erosion and sedimentation, pesticide application, introduction of predators such as bullfrogs and mosquito fish, disturbance activities associated with development that may alter the hydrologic functioning of the aquatic habitat, upland disturbance activities that may alter upland refugia and dispersal habitat, and activities such as road development and widening that may develop barriers for dispersal.

With the designation of critical habitat, the Service intends to conserve the physical and biological features that are essential to the conservation of the species, through the identification of the appropriate quantity and spatial arrangement of the primary constituent elements sufficient to support the life-history functions of the species. Because not all life-history functions require all the primary constituent elements, not all areas designated as critical habitat will contain all the primary constituent elements.

Environmental Baseline

California red-legged frog

Existing threats include loss and significant modification of habitat as a result of residential development and agriculture, disturbance from artificial lighting and noise, and predation or harassment by introduced bullfrogs and domestic pets. Both aquatic and upland habitat for the species occurs throughout the action area. There are perennial and seasonal creeks adjacent to each pump site where water will be released. The perennial creeks have pools and riparian vegetation that provide habitat for breeding, feeding and cover for California red-legged frogs. The seasonal creeks may provide temporary, marginal habitat for use by the species. According to the California Natural Diversity Database (CNDDB), California red-legged frogs have been reported at Tequisquita Slough, and Pacheco Creek in San Benito County (California Department of Fish and Game 2011). There are also three CNDDB records of California red-legged frog located on the Hill County Country Club and Golf Course that are within 1,000 feet of pipeline vault sites SCC#51 to SCC#56, and one-half mile east of Anderson Dam between Coyote Reservoir Road and Finley Ridge Road.). Therefore, the Service has determined it is reasonable to conclude the California red-legged frog inhabits and has the potential to be encountered within the action area, based on the biology and ecology of the species, the presence of suitable habitat, and the recent records of this species.

California tiger salamander

Existing threats include loss and significant modification of habitat as a result of residential development and agriculture, disturbance from artificial lighting and noise, and predation or harassment by introduced fish, wildlife, fish, and domestic pets. There are ten CNDDB records for California tiger salamander within and in close proximity to the action area. Four of these records occur in Santa Clara County. One of these is located on the Hill County Country Club and Golf Course that are within 1,000 feet of pipeline vault sites SCC#51 through SCC#56. Two of them are within 1.5 miles of the pipeline and the fourth is located within less than one mile of vault sites SCC# 36 to SCC#39.

The remaining six CNDDB records are located in San Benito County within less than 0.5 mile of the action area. Several small ponds were observed along an unpaved access road during the October 13, 2010 site visit less than 1,500 feet from this portion of the project action area. California tiger salamanders have been found along the northerly side of Highway 152; stock ponds and upslope grasslands along the northerly side of the highway affords more secure breeding and aestivation habitat. Currently, access to the project action area from this occupied habitat may be limited by the highway, San Felipe Lake, and the upper reach of Miller Canal, which drains the lake. The lake and canal host predatory fish which have access to the bottom-lands with the regular inundation of the adjacent pastures in high flows.).

Therefore, the Service has determined it is reasonable to conclude the California tiger salamander inhabits and has the potential to be encountered within the action area, based on the biology and ecology of the species, the presence of suitable habitat, and the recent records of this species.

California tiger salamander critical habitat

The proposed project is specifically located within a portion of the East Bay Region's Unit 12. This unit is approximately 6,642 acres and represents the San Felipe Unit. It contains all of the PCEs. Threats that require special management considerations include erosion, and sedimentation, pesticide application, non-native predators, residential development, agriculture, and road construction.

Effects of the Proposed Action

Mortality, injury, and harassment of California red-legged frogs and California tiger salamanders may occur on 1.656 acres, specifically, 0.5 acre of existing dirt road, 0.518 acre of staging areas, and 1.088 acres of off-road access through fields. Effects to these areas are expected to be temporary, occurring over only a few days at each site. The proposed conservation measures would minimize potential effects to listed species during work at each of these sites as well. Mortality, injury, or harassment of the California red-legged frog and California tiger salamander could occur from being crushed by project related equipment or vehicles, construction debris, and worker foot traffic within the action area. The collapse of small mammal burrows could expose individuals to predation or adverse environmental conditions. Work activities may cause individuals to leave the work site and surrounding areas which could subject the individuals to increased predation or adverse environmental conditions. This disturbance and displacement may increase the potential for predation, desiccation, competition for food and shelter, or strike by vehicles on roadways.

Other work activities associated with the Pipeline Maintenance Project also may adversely affect California red-legged frogs and California tiger salamanders. Trash left during or after project activities could attract predators to work sites, which could subsequently harass or prey on the animals. For example, raccoons, crows, and ravens are attracted to trash and also prey opportunistically on amphibians and reptiles. Accidental spills of hazardous materials or careless fueling or oiling of vehicles or equipment could degrade water quality or habitat to a degree where frogs and salamanders are adversely affected.

Conservation measures include in this project such as removing trash at the end of each work day, conducting biological resources awareness training for all project personnel, and including measures to prevent spills may reduce mortality, injury, or harassment of these listed species.

Biologists working in different areas and with different species may transmit diseases by introducing contaminated equipment. The chance of a disease being introduced into a new area is greater today than in the past due to the increasing occurrences of disease throughout amphibian populations in California and the United States. It is possible that chytrid fungus may exacerbate the effects of other diseases on California red-legged frogs or increase the sensitivity of this amphibian to environmental changes (e.g., water pH) that reduce normal immune response capabilities (Bosch et al. 2001). Implementation of the *Declining Amphibian*

Populations Task Force Fieldwork Code of Practice (Service 2005b) likely will prevent transfer of diseases through contaminated equipment or clothing.

California red-legged frogs and California tiger salamanders that use the action area for sheltering, feeding, or traveling overland could be displaced during project activities. Displacement of animals into unfamiliar areas could increase the risk of predation and increase the difficulty of finding required resources such as food and shelter.

Pre-activity surveys and the relocation of individual California red-legged frogs and California tiger salamanders may reduce injury or mortality. However, the capturing and handling of California red-legged frogs and California tiger salamanders to remove them from a work area may result in the harassment, mortality or injury of individuals. Stress, injury, and mortality may occur as a result of improper handling, containment, and transport of individuals. Death and injury of individual California red-legged frogs and/or California tiger salamanders could occur at the time of relocation or later in time subsequent to their release. Improper handling, containment, or transport of individuals will be reduced or prevented by use of a Service-approved biologist, by limiting the duration of handling, and requiring the proper transport of these species.

A portion of the Pipeline Maintenance Project will occur in California tiger salamander critical habitat Unit 12 of the East Bay Geographic Region. There will be effects to 0.137 acre of critical habitat which is less one percent of this unit. The effects to critical habitat will be temporary and no Primary Constituent Elements will be damaged or destroyed.

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.

Habitat loss, fragmentation, and urbanization pose the greatest conservation threats to the California red-legged frog and the California tiger salamander. Encroachment from residential developments could result in further habitat loss and fragmentation for the California red-legged frog and the California tiger salamander.

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

Agricultural lands, portions of streams and creeks, and San Felipe Lake are part of the action area, but are not under Federal ownership. Agricultural use of land in Santa Clara and northern San Benito Counties may continue to affect California red-legged frogs and California tiger salamanders. Cattle-grazing is a common land use practice, as well as dairy farming. Overgrazing results in degradation and loss of riparian vegetation, increased water temperatures, streambank and upland erosion, and decreased water quality in streams. These effects may occur on privately-owned lands adjacent to the lands owned by the Reclamation and managed by the Santa Clara Valley Water District. Livestock operations may also degrade water quality with pesticides and nutrient contamination.

However, light to moderate livestock grazing is generally thought to be compatible with continued habitat use by California red-legged frogs, California tiger salamanders, and other listed species, (Service 2004). The shorter vegetation associated with grazed areas may make the habitat more suitable for ground squirrels whose burrows are utilized by both of these amphibians.

Conclusion

After reviewing the current status of the California red-legged frog and the California tiger salamander, the environmental baseline for the project area, the effects of the proposed project, and the cumulative effects, it is the Service's biological opinion that the Pipeline Maintenance Project, as proposed, is not likely to jeopardize the continued existence of these two listed species because a limited number of individuals will be taken as a result of the project, relative to the status of the species in and around the action area and range-wide.

The effects to the primary constituent elements will be temporary and affect a small fraction of this unit of critical habitat for the Central California Distinct Population Segment of the California tiger salamander. Therefore, the Service has determined that the proposed Pipeline Maintenance Project will not result in the destruction or adverse modification of critical habitat for this species.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral 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 this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply.

Reclamation has a continuing duty to regulate the activity covered by this incidental take statement. If Reclamation (1) 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, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service anticipates that incidental take of the California red-legged frog and California tiger salamander will be difficult to detect because of their life histories. Specifically, when these animals are not in their breeding ponds, they inhabit the burrows of ground squirrels or other rodents or may be moving from one location to another, their cryptic appearance, size, and behavior, and scavenging of corpses by other animals, it is unlikely an injured or dead individual will be found. Losses of these species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service anticipates that all California red-legged frogs and California tiger salamanders inhabiting the 1.656 acres, as described in the February 2, 2011, electronic mail message from the Bureau to the Service, will be subject to incidental take in the form of capture, injury, death, harm, and harassment.

Upon implementation of the Reasonable and Prudent Measures, these levels of incidental take associated with the Pipeline Maintenance Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog and California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

Effect of the Take

The Service has determined that this level of anticipated take is not likely to result in jeopardy to California red-legged frog or California tiger salamander or result in destruction or adverse modification of designated critical habitat for the California tiger salamander.

Reasonable and Prudent Measure

The Service has determined that the following reasonable and prudent measure is necessary and appropriate to minimize the effects of the Pipeline Maintenance Project on the California red-legged frog and California tiger salamander:

> Adverse effects to California red-legged frogs and California tiger salamanders and their habitat will be minimized to the extent possible.

Terms and conditions

In order to be exempt from the prohibitions of Section 9 of the Act, Reclamation 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. The following Terms and Conditions implement the Reasonable and Prudent Measure:

   a. Reclamation shall require the Santa Clara Valley Water District to fully implement the *Conservation Measures* and *Terms and Conditions* in this biological opinion.

   b. Reclamation shall require the Santa Clara Valley Water District to comply with the *Reporting Requirements* of this biological opinion, including a post construction report outlining how the Conservation Measures were implemented for this project.

   c. Reclamation shall require the Santa Clara Valley Water District to not utilize plastic mono-filament netting (erosion control matting) or similar material containing netting at the project. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

   d. To avoid transferring disease or pathogens while handling California red-legged frogs and California tiger salamanders Reclamation shall require the Santa Clara Valley Water District to follow the *Declining Amphibian Populations Task Force Fieldwork Code of Practice* (Service 2005b)

   e. If requested, before, during, or after completion of pipeline maintenance activities, Reclamation shall require the Santa Clara Valley Water District to allow immediate access to the project site by the Service, California Department of Fish and Game, or their designated agents, to review the effects of the project on the California tiger salamander, California red-legged frog, and their habitats..

Reporting Requirements

The Service and the Department of Fish and Game must be notified within one (1) working day of the finding of any injured or dead California red-legged frog, California tiger salamander or any unanticipated damage to their habitats associated with the proposed project. Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as the Service-approved biologist. Notification must include the date, time, and precise location of the individual/incident clearly indicated on a USGS 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information. Dead individuals must be sealed in a Zip-lock® plastic bag containing a paper with the date and time when the animal was found, the location where it was found, and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site. The Service contact persons are the Division Chief in the Endangered Species Program at telephone 916/414-6600; and the

Resident Agent-in-Charge of the Service's Division of Law Enforcement at telephone 916/414-6660. The Department of Fish and Game contact for Santa Clara County is Conrad Jones at telephone 650/328-2380, and the contact for San Benito County is Jess Cann at telephone 831/649-7194.

Reclamation through the Santa Water Valley Water District shall submit a post-construction compliance report prepared by the Service-approved biologist to the Sacramento Fish and Wildlife Office and the California Department of fish and Game within thirty (30) calendar days of the date of the completion of construction activity. This report shall detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the California red-legged frog and California tiger salamander, if any; (v) occurrences of incidental take of California red-legged frogs and California tiger salamanders if any; (vi) documentation of employee environmental education; and (vii) other pertinent information.

CONSERVATION RECOMMENDATIONS

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

1. Reclamation should develop and implement the appropriate restoration measures in areas designated in the *Recovery Plan for the California Red-legged Frog* (Service 2002).

2. To minimize further spread of hybridization with the non-native barred tiger salamander, Reclamation should eliminate, to the degree possible, permanent ponds,

3. Reclamation should encourage or require the use of appropriate California native plant species in vegetation and habitat enhancement efforts.

4. Reclamation should incorporate "environmentally friendly" erosion and stabilization techniques whenever possible in this project.

5. To avoid transferring disease or pathogens while handling amphibians, Reclamation should encourage all applicants to follow the *Declining Amphibian Populations Task Force Fieldwork Code of Practice* (Service 2005b).

6. Sightings of any listed or sensitive animal species should be reported to the California Natural Diversity Database of the California Department of Fish and Game. A copy of the reporting form and a topographic map clearly marked with the location the animals were observed also should be provided to the Service.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting 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 Pipeline Maintenance Project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, the action agency must immediately request reinitiation of formal consultation. Please contact Chris Nagano, Chief of our Endangered Species Division, at the letterhead address, via electronic mail, or at telephone 916/414-6600, if you have any questions regarding this biological opinion.

cc:
David Matthews, Santa Clara Valley Water District, San Jose, California
Liam Davis, Conrad Jones, Jess Cann, California Department of Fish and Game, Yountville, California
Chad Mitcham, U.S. Fish and Wildlife Service, Ventura, California

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FINAL ENVIRONMENTAL ASSESSMENT

SANTA CLARA CONDUIT MAINTENANCE AND REPAIRS

Appendix E
Reclamation Documentation

February 2011

From:	Goodsell, Joanne E
To:	Clinton, Patricia L;
cc:	Barnes, Amy J; Bruce, Brandee E; Dunay, Amy L; Fogerty, John A; Leigh, Anastasia T; Nickels, Adam M; Overly, Stephen A; Perry, Laureen (Laurie) M;
Subject:	Santa Clara Conduit Maintenance and Repairs: EA-10-050 / 11-SCAO-012
Date:	Thursday, December 30, 2010 1:44:39 PM
Attachments:	JEG.edits.DEA-10-050 SantaClaraConduit.docx

Tracking No. 11-SCAO-012

Patti:

The no action and proposed action alternative as described in the Draft EA for Santa Clara Conduit Maintenance and Repairs (EA-10-050) have no potential to cause effects on historic properties pursuant to the regulations at 36 CFR Part 800.3(a)(1). SCVWD, on behalf of Reclamation, proposes to drain, inspect, repair, and refill the Santa Clara Conduit. This Reclamation-owned facility is a component of the San Felipe Division of Reclamation's Central Valley Project (CVP). All proposed work will take place in or on the conduit itself, or within areas immediately surrounding the conduit that were heavily disturbed during its original construction or as a result of prior maintenance work. No previously undisturbed ground will be impacted as a result of this project. Additionally, the Santa Clara Conduit, as with the other features of the San Felipe Division, is less than 50 years old and has not achieved exceptional significance within the last 50 years. The Santa Clara Conduit, therefore, is not considered a historic property eligible for inclusion in the National Register of Historic Places, either individually or as a contributing element to the Central Valley Project (CVP). As such, the no action and proposed action alternative have no potential to cause effects on historic properties and will result in no impacts to cultural resources.

Pursuant to the Regulations at 36 CFR Part 800.3(a)(1), Reclamation has completed the Section 106 process for this undertaking. Please note that I have made some edits to Sections 3.6 and 4.3, and added my name to the Section 5 list of preparers, in the attached Draft EA. Thank you for the opportunity to comment.

Sincerely,

Joanne Goodsell, M.A.
Archeologist, Bureau of Reclamation
Mid-Pacific Regional Office
2800 Cottage Way, MP-153
Sacramento, CA 95825
(916) 978-5499 jgoodsell@usbr.gov

From:	Robbins, Eleanor J (Ellie)
To:	Clinton, Patricia L;
cc:	Rivera, Patricia L;
Subject:	FW: ITA Request form for draft EA-10-050
Date:	Monday, January 03, 2011 7:13:06 AM
Attachments:	ITA Request Form-EA-10-050 Santa Clara conduit.doc

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Patti,

I reviewed the proposed action and find no potential affects to Indian Trust Assets. The nearest

ITA is Lytton Rancheria, which is approximately 67 miles NW of the project location.

Patricia

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Thanks.

Ellie Robbins

Principal GIS Analyst

Regional GIS Data Steward

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