

INFORMATION HANDOUT

UNITED STATES FISH AND WILDLIFE SERVICE
(BIOLOGICAL OPINION AND AMENDMENTS)

UNITED STATES ARMY CORPS OF ENGINEERS
(DEPARTMENT OF THE ARMY CORPS 404 PERMIT)
PERMIT # 28771S

STATE OF CALIFORNIA DEPARTMENT OF FISH AND GAME
(1602 LAKE AND STREAMBED ALTERATION AGREEMENT)
NOTIFICATION NO.1600-2006-0059-3

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
(WASTE DISCHARGE REQUIREMENTS AND WATER QUALITY CERTIFICATION 401 PERMIT)
BOARD ORDER NO. R2-2006-0033

INCIDENTAL TAKE PERMIT
(CALIFORNIA DEPARTMENT OF FISH AND GAME 1602 LAKE AND STREAMBED ALTERATION
AGREEMENT)

ROUTE: 04-Ala-580-R8.3



United States Department of the Interior

FISH AND WILDLIFE SERVICE

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



JENSEN
CALIF Young
3/14/05

In reply refer to:
1-1-04-F-0115

February 28, 2005

Mr. Gene Fong
Federal Highway Administration
Department of Transportation
650 Capital Mall, Suite 4-100
Sacramento, California 95814

Subject: Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment, Southwest of Livermore, Alameda County, California

Dear Mr. Fong:

This is in response to your February 17, 2004, request for formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed addition of truck climbing lanes and curve corrections to State Route 84 (Pigeon Pass) in Alameda County, California. Your request was received in this Field Office on February 18, 2004. This document represents the Service's biological opinion on the effects of the action on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), threatened California red-legged frog (*Rana aurora draytonii*), threatened California tiger salamander (*Ambystoma californiense*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*); and conference opinion on the effects of the action on the proposed critical habitats for the California tiger salamander and the California red-legged frog. This document is issued pursuant to section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

This biological opinion is based on: (1) a letter from the Federal Highway Administration to the Service dated February 17, 2004; (2) *Early Evaluation for the San Joaquin Kit Fox for the Pigeon Pass Curve Correction Project* dated August 22, 2002, that was prepared by the California Department of Transportation; (3) *Biological Assessment Pigeon Pass Curve Realignment, Alameda County State Route 84, southwest of Livermore, Ca 04-Ala-84-33.3-37.0 (20.6-23.0) 04-172400* (Biological Assessment) dated February 2004, that was received by the Service on February 18, 2004; (4) *Large Branchiopod Dry (2002) and Wet (2002-2003) Season Surveys Caltrans SR 84 Curve realignment Project* dated May 2003 that was prepared by URS; (5) a visit to the project site by Chris Nagano of the Service on November 8, 2004; (6) a meeting

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on November 9, 2004, between Cay Goude and Susan Moore of the Service, and Gary Winters, Susan Chang, and Jeff Jensen of the California Department of Transportation; (7) a telephone conference between Chris Nagano, and John Webb, Shanna Zahner, Jeanie Baker, and Chris Collision on November 18, 2004; (8) a letter from the California Department of Transportation to the Service dated November 18, 2004; a meeting between Chris Nagano, Cay Goude, Susan Moore, Catrina Martin, and Jim Browning of the Service and Jeff Jensen, Chuck Morton, and other staff of the California Department of Transportation; (9) a e-mail dated December 15, 2004, from Chris Collision of the California Department of Transportation to the Service; (10) a letter from the California Department of Transportation to the Service dated February 15, 2005; (11) e-mail and telephone conversations between the California Department of Transportation and the Service; and (12) other information available to the Service.

CONSULTATION HISTORY

- August 29, 2002: The Service received the *Early Evaluation for the San Joaquin Kit Fox for the Pigeon Pass Curve Correction Project*.
- September 19, 2002: Heather Bell and Adam Zerrenner of the Service met with Shanna Zahner of the California Department of Transportation to discuss the San Joaquin kit fox.
- February 18, 2004: A letter requesting initiation of formal consultation dated February 17, 2004, and the Biological Assessment from the Federal Highway Administration were received by the Service.
- August 11, 2004: Ann Bowers of the Service met with Shanna Zahner of the California Department of Transportation to discuss the San Joaquin kit fox, California tiger salamander, and California red-legged frog.
- October 4, 2004: Shanna Zahner advised the Service that nighttime construction may be necessary to complete the action within three construction seasons.
- November 8, 2004: Chris Nagano of the Service conducted a field visit at the proposed project site.
- November 9, 2004: Susan Moore and Cay Goude of the Service, and Gary Winters, Susan Chang and Jeff Jensen of the California Department of Transportation discussed the proposed project.
- November 18, 2004: Chris Nagano, and John Webb, Shanna Zahner, Jeanie Baker, and Chris Collision of the California Department of Transportation discussed the proposed project on the telephone.
- November 18, 2004: The California Department of Transportation sent a letter dated November 18, 2004, via e-mail to the Service that stated they will provide protection in perpetuity for habitat affected by the proposed project (3:1 for permanent loss; 1:1 for temporary loss; temporary impacts to California red-legged frog would be restored on-site).
- November 18, 2004: The Service sent an e-mail to the California Department of Transportation requesting habitat protection in perpetuity be provided for the loss of California red-legged frog habitat, and an assessment of effects to the habitat of this species in the southern portion of the proposed project.

- November 23, 2004: In response to a request from the Service, the California Department of Transportation sent an e-mail of a photo and plans for the driveway undercrossings of State Route 84.
- November 20, 2004: The Service sent the California Department of Transportation an e-mail request for additional information on the culvert undercrossings intended for wildlife at the proposed project.
- November 25, 2004: The Service sent the California Department of Transportation an e-mail request for additional information on the lighting that will be used at the proposed project due to the potential effect on the nocturnal activities of the fox, frog, and salamander.
- November 28, 2004: The Service sent the California Department of Transportation an e-mail request for additional information on the vernal pools that will be affected by the proposed project.
- December 5, 2004: The California Department of Transportation sent an e-mail containing portions of the information that the Service had requested in order to complete the analysis necessary for the formal consultation.
- December 8, 2004: Chris Nagano, Cay Goude, Susan Moore, Catrina Martin, and Jim Browning of the Service discussed the project with Jeff Jensen, Chuck Morton, and other members of the California Department of Transportation. The California Department of Transportation stated they would compensate for the adverse effects of the project on the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp.
- December 14, 2004: The California Department of Transportation sent an e-mail containing portions of the information that the Service had requested in order to complete the analysis necessary for the formal consultation.
- December 15, 2004: Chris Collision of the California Department of Transportation sent an e-mail to Chris Nagano of the Service stating that the Marysville office of the California Department of Transportation, not their Oakland office, was responsible for all negotiations and decisions on the formal consultation on the Pigeon Pass Project.
- December 20, 2004: The Service sent an e-mail to the California Department of Transportation requesting information on night lighting, vernal pools, and the California red-legged frog at the project site.
- January 7, 2005: Chris Nagano, Wayne White, Susan Moore, and Cay Goude discussed the proposed project with Susan Chang and Jeff Jensen of the California Department of Transportation.
- February 15, 2005: The Service received a letter from Susan Chang of the California Department of Transportation regarding the habitat for the California tiger salamander, California red-legged frog, San Joaquin kit fox, and the vernal pool fairy shrimp that will be protected as compensation for adverse effects resulting from the proposed project.

BIOLOGICAL OPINION

Description of Proposed Action

It is our understanding, the Pigeon Pass Project is intended to correct existing horizontal and vertical alignment deficiencies on State Route 84 south of Livermore in Alameda County, California. The purpose of the project is to improve safety and traffic operations by realigning and adding truck climbing lanes through the Vallecitos Hills/Pigeon Pass area, thereby reducing the accident rate for this corridor.

The westbound truck-climbing lane would begin west of the signalized intersection at Ruby Hills Drive/State Route 84 and continue approximately 1600 feet west of the crest in the vertical profile of Pigeon Pass. The eastbound truck-climbing lane begins prior to the 6% uphill grade west of Pigeon Pass and continues over Pigeon Pass to the intersection of Ruby Hills Drive. There will be a 11.8 feet wide paved median, intended to function as a left turn and acceleration lane. The paved width of the new alignment will vary from 43.3 to 78.7 feet, and from Pigeon Pass to the west end it varies from 78.7 to 43.3 feet. The project requires the relocation of a 2 foot diameter natural gas transmission pipeline located approximately 1,792 feet west of Pigeon Pass. The earthwork is balanced, and therefore, a disposal site is not necessary. Approximately 17,655,367 cubic feet will be excavated and reused as fill within the cut and fill units.

Construction of the project is expected to begin in 2005 and be complete by 2007. It will most likely be constructed in three phases. The first phase will include construction of the westerly two-thirds of the frontage road (private landowner access) and temporary detour; the second phase will include constructing the last one-third of the frontage road, removal of temporary detour, and completing the conforms. The third phase will include constructing the last one-third of the frontage road, removal of temporary detour, and completing the conforms. At this time blasting and pile driving activities are not expected. Equipment used to perform the work could include, but is not limited to, scrapers, dozers, graders, and dump trucks. Nighttime construction of an unknown duration and extent will be conducted at the project site.

Avoidance and Protection Measures – Listed Species

According to the Biological Assessment, the February 15, 2005, letter from California to the Service, and other information available to the Service, the California Department of Transportation proposes to avoid, minimize, and compensate for effects to listed species through the following measures:

1. No ground disturbing activities will be conducted between October 31st and March 1st outside the limits of the established road bed. Established roadbeds include all pre-existing and project-constructed unimproved, as well as, improved roads.
2. The potential for adverse effects caused by poor water quality will be avoided by implementing temporary and permanent Best Management Practices outlined in section 7-7.01G of the California Department of Transportation's Standard Specifications.

3. The contractor shall be required to submit a Storm Water Pollution Prevention Plan as required by the National Pollutant Discharge Elimination System permit.
4. Additional water quality protection measures required by other permits such as the California Department of Fish and Game's Lake and Streambed Alteration Agreement will be implemented.
5. Twelve drainage culverts and two driveway under crossings will be installed throughout the project area, which can provide a method of crossing under the new highway.
6. A qualified biologist shall be on-site or on-call during all activities that could result in the take of listed species. The qualification of the biologist(s) shall be presented to the Service for review and approval at least 60 calendar days prior to any groundbreaking at the project site. The biologist(s) shall be given the authority to stop any work that may result in the take of listed species. If the biologist(s) exercises this authority, the Service and the California Department of Fish and Game shall be notified by telephone and electronic mail within one (1) working day. The Service contact is the Deputy Assistant Field Supervisor, Endangered Species Program at the Sacramento Fish and Wildlife Office at telephone 916/414-6600.
7. Environmentally sensitive areas (ESAs) will be established, and marked in the field with standard orange mesh ESA fencing, around known avoidable vernal pools, amphibian breeding and aestivation areas, and any active, or potentially active, kit fox dens. Under the direction of the California Department of Transportation Resident Engineer, with the aid of the Service approved biologist, the ESA fence will be erected around the ESAs to prevent areas from being disturbed during construction.
8. The limits of the construction area will be flagged, if not already marked by right of way, or other, fencing, and all activity will be confined within the marked area. All access to and from the project area will be clearly marked in the field with appropriate flagging and signs. Prior to commencing construction activities, the contractor will determine construction vehicle parking and all access.
9. Project-related vehicles shall observe a 20-mile per hour speed limit in all project areas, except on county roads and State and Federal highways; this is particularly important at night when California red-legged frogs, California tiger salamanders, and kit foxes are most active.
10. To the extent possible, nighttime construction should be minimized. Construction crews will be informed during the education program meeting that, to the extent possible, travel within the marked project site will be restricted to established roadbeds. Established roadbeds include all pre-existing and project-constructed unimproved, as well as, improved roads.

11. An employee education program shall be conducted, consisting of a brief presentation by persons knowledgeable in vernal pool, California tiger salamander, red-legged frog, and kit fox biology and legislative protection to explain endangered species concerns to contractors, their employees, and any other personnel involved in the project. The program should include the following: a description of the species and their habitat needs; a report of the occurrence of these species in the project area; an explanation of the status of these species and their protection under the Endangered Species Act; and a list of measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information should be prepared for distribution to the above-mentioned people and anyone else who may enter the project site. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures.
12. For compensation for permanent and temporary loss of habitat listed below, where habitat is suitable for both the San Joaquin kit fox and the California tiger salamander, its preservation may be counted toward the preservation of both species.
13. The California Department of Transportation will divide the 132 acres of compensation habitat for the San Joaquin kit fox and the California tiger salamander by purchasing 80 credit acres for the California tiger salamander and providing payment for 52 acres into the Service's San Joaquin Kit Fox Fund. The California Department of Transportation is proposing to purchase 80 acres of conservation credits at the Ohlone Conservation Bank. The California Department of Transportation will pay \$650,000.00 (52 acres x \$12,500/acre) into the San Joaquin Kit Fox Fund.

Avoidance and Protection Measures - San Joaquin Kit Fox

1. Preconstruction/pre-activity surveys shall be conducted by a Service approved biological monitor according to the *Standard Recommendation for the Protection of the San Joaquin kit fox Prior to or During Ground Disturbance* (Standard Recommendations) (U.S. Fish and Wildlife Service 1997) no less than 14 days and no more than 30 days prior to the beginning of project implementation. Surveys shall identify kit fox habitat features on the project site and evaluate use by kit fox and, if possible, and assess the potential impacts to the kit fox by the proposed activity. The status of all dens should be determined and mapped in accordance with the survey protocol.
2. Written results of preconstruction/pre-activity surveys must be received by the Service within five days after survey completion and prior to the start of ground disturbance and/or construction activities. If a natal/pupping den is discovered within the project area or within (200-feet) of the project boundary, the Service shall be immediately notified. In accordance with the Standard Recommendations, after preconstruction surveys, dens which are determined by California Department of Transportation to be unavoidable

during construction may be destroyed by excavation, with the exception of natal/pupping dens.

3. Following preconstruction den searches and excavations of unavoidable dens but before construction begins, the Resident Engineer, with the assistance of the Service approved biologist, will establish Environmentally Sensitive Areas around those kit fox dens which are determined by the California Department of Transportation to be reasonably avoidable. ESA radii will be: potential den = (50 feet); known den = (100 feet); natal or pupping den = to be determined on a case-by-case basis in coordination with the Service and the California Department of Fish and Game.
4. To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than (2 feet) deep should be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals.
5. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipe becoming trapped or injured. All construction pipes, culverts, or similar structures with a diameter of (4-inches) or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for kit foxes prior to commencing construction activities for the day, or, at the latest, before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe should not be moved until the Service has been consulted. If necessary, and under the direct supervision of the Service approved biological monitor, the pipe may be moved once to remove it from the path of construction activity, until the fox has escaped.
6. All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in closed containers and removed at least once a week from a construction or project site.
7. California Department of Transportation employees, contractors, and contractors' employees shall not have firearms on the project site. This shall not apply to authorized security personnel, or local, State, or Federal law enforcement officials.
8. The California Department of Transportation Resident Engineer is the point of contact in the event that any employee or contractor might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped individual. The Resident Engineer will be identified in the employee education program. The Resident Engineer's name and phone number will be provided to the Service.

9. Upon completion of the project, all areas subject to temporary ground disturbances, including storage and staging areas, temporary roads, pipeline corridors, etc. shall be re-contoured if necessary, and revegetated to promote restoration of the area to pre-project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the project, but that after project completion will not be subject to further disturbance and has the potential to be revegetated. Appropriate methods and plant species used to revegetate such areas should be determined on a site-specific basis in consultation with the Service, California Department of Fish and Game, and revegetation experts.

Avoidance and Protection Measures - California Tiger Salamander

1. To minimize direct mortality to breeding adults and juveniles using the pool that will be filled, construction at the pool will be restricted to a period after the pool has completely dried (normally by mid-July).

Avoidance and Protection Measures - California Red-Legged Frog

1. A survey and relocation program for California red-legged frogs will be implemented no less than 14 days and no more than 30 days prior to the onset of construction. All red-legged frog habitat previously identified in the Biological Assessment will be surveyed for red-legged frogs by a Service approved biologist. If frogs are found they will be relocated to Ruby Hills/Vineyard Estates mitigation site, pending final written approval from the site managers. If final approval can not be obtained for the Ruby Hills/Vineyard Estates mitigation site, the California Department of Transportation will submit a new location for consideration. No relocation activities will begin until the California Department of Transportation has received written approval of the alternate relocation site from the Service. All biologists involved with the surveying/handling of the red-legged frogs will employ sterilization techniques appropriate to avoid the transmission of chytrid fungus to or from the site.
2. All fueling and maintenance of vehicles and other equipment and staging areas shall occur at least 60 feet from any riparian habitat or water body. The California Department of Transportation shall ensure contamination of habitat does not occur during such operations. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.
3. Areas of red-legged frog habitat that are avoidable will be fenced with standard orange mesh Environmentally Sensitive Area fencing.
4. The California Department of Transportation will purchase 25 acres of California red-legged frog habitat. The Service has agreed that 25 acres of the 80 credit acres that will be purchased at the Ohlone Conservation Bank also will be credited towards the listed frog.

Avoidance and Protection Measures - Vernal Pool Fairy Shrimp

1. The California Department of Transportation will purchase 2.06 acres or 2.06 acre credits of habitat for the vernal pool fairy shrimp. The California Department of Transportation will ensure the Service approves of the means of compensation that will be used for this listed crustacean prior to construction.

STATUS OF SPECIES/ENVIRONMENTAL BASELINE

San Joaquin Kit Fox

The San Joaquin kit fox was listed as an endangered species on March 11, 1967 (U.S. Fish and Wildlife Service 1967) and it was listed by the State of California as a threatened species on June 27, 1971. The *Recovery Plan for Upland Species of the San Joaquin Valley, California* includes this listed canine (U.S. Fish and Wildlife Service 1998).

In the San Joaquin Valley before 1930, the range of the San Joaquin kit fox extended from southern Kern County north to Tracy in San Joaquin County, on the west side, and near La Grange in Stanislaus County, on the east side (Grinnell *et al.* 1937; U.S. Fish and Wildlife Service 1998). Historically, this species occurred in several San Joaquin Valley native plant communities. In the southernmost portion of the range, these communities included Valley Sink Scrub, Valley Saltbush Scrub, Upper Sonoran Subshrub Scrub, and Annual Grassland. San Joaquin kit foxes also exhibit a capacity to utilize habitats that have been altered by man. The animals are present in many oil fields, grazed pasturelands, and "wind farms" (Cypher 2000). Kit foxes can inhabit the margins and fallow lands near irrigated row crops, orchards, and vineyards, and may forage occasionally in these agricultural areas (U.S. Fish and Wildlife Service 1998). There are a limited number of observations of San Joaquin kit foxes foraging in trees in urban areas (Murdoch *et al.* 2005). The San Joaquin kit fox seems to prefer more gentle terrain and decreases in abundance as terrain ruggedness increases (Grinnell *et al.* 1937; Morrell 1972; Warrick and Cypher 1998).

Adult San Joaquin kit foxes are usually solitary during late summer and fall. In September and October, adult females begin to excavate and enlarge natal dens (Morrell 1972), and adult males join the females in October or November (Morrell 1972). Typically, pups are born between February and late March following a gestation period of 49 to 55 days (Egoscue 1962; Morrell 1972; Spiegel and Tom 1996; U.S. Fish and Wildlife Service 1998). Mean litter sizes reported for San Joaquin kit foxes include 2.0 on the Carrizo Plain (White and Ralls 1993), 3.0 at Camp Roberts (Spencer *et al.* 1992), 3.7 in the Lokern area (Spiegel and Tom 1996), and 3.8 at the Naval Petroleum Reserve (Cypher *et al.* 2000). Pups appear above ground at about age 3-4 weeks, and are weaned at age 6-8 weeks. Reproductive rates, the proportion of females bearing young, of adult San Joaquin kit foxes vary annually with environmental conditions, particularly food availability. Annual rates range from 0-100%, and reported mean rates include 61% at the Naval Petroleum Reserve (Cypher *et al.* 2000), 64% in the Lokern area (Spiegel and Tom 1996),

and 32% at Camp Roberts (Spencer *et al.* 1992). Although some yearling female kit foxes will produce young, most do not reproduce until age 2 years (Spencer *et al.* 1992; Spiegel and Tom 1996; Cypher *et al.* 2000). Some young of both sexes, but particularly females may delay dispersal, and may assist their parents in raising the following year's litter of pups (Spiegel and Tom 1996). The young kit foxes begin to forage for themselves at about four to five months of age (Koopman *et al.* 2000; Morell 1972).

Although most young kit foxes disperse less than 5 miles (Scrivner *et al.* 1987a), dispersal distances of up to 76.3 miles have been documented for the San Joaquin kit fox (Scrivner *et al.* 1993; U.S. Fish and Wildlife Service 1998). Dispersal can be through disturbed habitats, including agricultural fields, and across highways and aqueducts. The age at dispersal ranges from 4-32 months (Cypher 2000). Among juvenile kit foxes surviving to July 1 at the Naval Petroleum Reserve, 49% of the males dispersed from natal home ranges while 24% of the females dispersed (Koopman *et al.* 2000). Among dispersing kit foxes, 87% did so during their first year of age. Most, 65.2%, of the dispersing juveniles at the Naval Petroleum Reserve died within 10 days of leaving their natal home den (Koopman *et al.* 2000). Some kit foxes delay dispersal and may inherit their natal home range.

San Joaquin kit foxes are reputed to be poor diggers, and their dens are usually located in areas with loose-textured, friable soils (Morrell 1972; O'Farrell 1983). However, the depth and complexity of their dens suggest that they possess good digging abilities, and kit fox dens have been observed on a variety of soil types (U.S. Fish and Wildlife Service 1998). Some studies have suggested that where hardpan layers predominate, kit foxes create their dens by enlarging the burrows of California ground squirrels (*Spermophilus beecheyi*) or badgers (*Taxidea taxus*) (Jensen 1972; Morrell 1972; Orloff *et al.* 1986). In parts of their range, particularly in the foothills, kit foxes often use ground squirrel burrows for dens (Orloff *et al.* 1986). Kit fox dens are commonly located on flat terrain or on the lower slopes of hills. About 77 percent of all kit fox dens are at or below midslope (O'Farrell 1983), with the average slope at den sites ranging from 0 to 22 degrees (California Department of Fish and Game 1980; O'Farrell 1983; Orloff *et al.* 1986). Natal and pupping dens are generally found in flatter terrain. Common locations for dens include washes, drainages, and roadside berms. Kit foxes also commonly den in human-made structures such as culverts and pipes (O'Farrell 1983; Spiegel *et al.* 1996a).

Natal and pupping dens of the San Joaquin kit fox may include from two to 18 entrances and are usually larger than dens that are not used for reproduction (O'Farrell *et al.* 1980; O'Farrell and McCue 1981). Natal dens may be reused in subsequent years (Egoscue 1962). It has been speculated that natal dens are located in the same location as ancestral breeding sites (O'Farrell 1983). Active natal dens are generally 1.2 to 2 miles from the dens of other mated kit fox pairs (Egoscue 1962; O'Farrell and Gilbertson 1979). Natal and pupping dens usually can be identified by the presence of scat, prey remains, matted vegetation, and mounds of excavated soil (i.e. ramps) outside the dens (O'Farrell 1983). However, some active dens in areas outside the valley floor often do not show evidence of use (Orloff *et al.* 1986). During telemetry studies of kit foxes in the northern portion of their range, 70 percent of the dens that were known to be active showed no sign of use (e.g., tracks, scats, ramps, or prey remains) (Orloff *et al.* 1986). In another

more recent study in the Coast Range, 79 percent of active kit fox dens lacked evidence of recent use other than signs of recent excavation (Jones and Stokes Associates 1997).

A San Joaquin kit fox can use more than 100 dens throughout its home range, although on average, an animal will use approximately 12 dens a year for shelter and escape cover (Cypher *et al.* 2001). Kit foxes typically use individual dens for only brief periods, often for only one day before moving to another den (Ralls *et al.* 1990). Possible reasons for changing dens include infestation by ectoparasites, local depletion of prey, or avoidance of coyotes (*Canis latrans*). Kit foxes tend to use dens that are located in the same general area, and clusters of dens can be surrounded by hundreds of hectares of similar habitat devoid of other dens (Egoscue 1962). In the southern San Joaquin Valley, kit foxes were found to use up to 39 dens within a denning range of 320 to 482 acres (Morrell 1972). An average den density of one den per 69 to 92 acres was reported by O'Farrell (1984) in the southern San Joaquin Valley.

Dens are used by San Joaquin kit foxes for temperature regulation, shelter from adverse environmental conditions, and escape from predators. Kit foxes excavate their own dens, use those constructed by other animals, and use human-made structures (culverts, abandoned pipelines, and banks in sumps or roadbeds). Kit foxes often change dens and may use many dens throughout the year; however, evidence that a den is being used by kit foxes may be absent. San Joaquin kit foxes have multiple dens within their home range and individual animals have been reported to use up to 70 different dens (Hall 1983). At the Naval Petroleum Reserve, individual kit foxes used an average of 11.8 dens per year (Koopman *et al.* 1998). Den switching by the San Joaquin kit fox may be a function of predator avoidance, local food availability, or external parasite infestations (e.g., fleas) in dens (Egoscue 1956).

The diet of the San Joaquin kit fox varies geographically, seasonally, and annually, based on temporal and spatial variation in abundance of potential prey. Known prey species of the kit fox include white-footed mice (*Peromyscus* spp.), insects, California ground squirrels, kangaroo rats (*Dipodomys* spp.), San Joaquin antelope squirrels (*Ammospermophilus nelsoni*), black-tailed hares (*Lepus californicus*), and chukar (*Alectoris chukar*) (Jensen 1972; Archon 1992). Kit foxes also prey on desert cottontails (*Sylvilagus audubonii*), ground-nesting birds, and pocket mice (*Perognathus* spp.).

The diets and habitats selected by coyotes and San Joaquin kit foxes living in the same areas are often quite similar. Hence, the potential for resource competition between these species may be quite high when prey resources are scarce such as during droughts, which are quite common in semi-arid, central California. Competition for resources between coyotes and kit foxes may result in kit fox mortalities. Coyote-related injuries accounted for 50-87 per cent of the mortalities of radio collared kit foxes at Camp Roberts, the Carrizo Plain Natural Area, the Lokern Natural Area, and the Naval Petroleum Reserve (Cypher and Scrivner 1992; Standley *et al.* 1992).

San Joaquin kit foxes are primarily nocturnal, although individuals are occasionally observed resting or playing (mostly pups) near their dens during the day (Grinnell *et al.* 1937). Kit foxes

occupy home ranges that vary in size from 1.7 to 4.5 square miles (White and Ralls 1993). A mated pair of kit foxes and their current litter of pups usually occupy each home range (White and Ralls 1993, Spiegel 1996; White and Garrott 1997). Other adults, usually offspring from previous litters, also may be present (Koopman *et al.* 2000), but individuals often move independently within their home range (Cypher 2000). Ralls *et al.* (2001) found that foxes sometimes share dens with foxes from other groups; many of these cases involved unpaired individuals and appeared to be unsuccessful attempts at pair formation. Average distances traveled each night range from 5.8 to 9.1 miles and are greatest during the breeding season (Cypher 2000).

Kit foxes maintain core home range areas that are exclusive to mated pairs and their offspring. This territorial spacing behavior eventually limits the number of foxes that can inhabit an area owing to shortages of available space and per capita prey. Hence, as habitat is fragmented or destroyed, the carrying capacity of an area is reduced and a larger proportion of the population is forced to disperse. Increased dispersal generally leads to lower survival rates and, in turn, decreased abundance because greater than 65 percent of dispersing juvenile foxes die within 10 days of leaving their natal range (Koopman *et al.* 2000).

Estimates of fox density vary greatly throughout its range, and have been reported as high as 3.11 per square mile in optimal habitats in good years (U.S. Fish and Wildlife Service 1998). At the Elk Hills in Kern County, density estimates varied from 0.7 animals per square kilometer (1.86 animals per square mile) in the early 1980s to 0.01 animals per square kilometer (0.03 animals per square mile) in 1991 (U.S. Fish and Wildlife Service 1998). Kit fox home ranges vary in size from approximately 1 to 12 square miles (Spiegel *et al.* 1996b; U.S. Fish and Wildlife Service 1998). Knapp (1978) estimated that a home range in agricultural areas is approximately 1 square mile. Individual home ranges overlap considerably, at least outside the core activity areas (Morrell 1972; Spiegel *et al.* 1996b).

Mean annual survival rates reported for adult San Joaquin kit foxes include 0.44 at the Naval Petroleum Reserve (Cypher *et al.* 2000), 0.53 at Camp Roberts (Standley *et al.* 1992), 0.56 at the Lokern area (Spiegel and Disney 1996), and 0.60 on the Carrizo Plain (Ralls and White 1995). However, survival rates widely vary among years (Spiegel and Disney 1996; Cypher *et al.* 2000). Mean survival rates for juvenile San Joaquin kit foxes (<1 year old) are lower than rates for adults. Survival to age 1 year was 0.14 at the Naval Petroleum Reserve (Cypher *et al.* 2000), 0.20 at Camp Roberts (Standley *et al.* 1992), and 0.21 on the Carrizo Plain (Ralls and White 1995). For both adults and juveniles, survival rates of males and females are similar. San Joaquin kit foxes may live to ten years in captivity (McGrew 1979) and 8 years in the wild (Berry *et al.* 1987), but most kit foxes do not live past 2-3 years of age.

The status (i.e., distribution, abundance) of the kit fox has decreased since its listing in 1967. This trend is reasonably certain to continue into the foreseeable future unless measures to protect, sustain, and restore suitable habitats, and alleviate other threats to their survival and recovery, are implemented. Threats that are seriously affecting kit foxes are described in further detail in the following sections.

Loss of Habitat

Less than 20 percent of the habitat within the historical range of the kit fox remained when the animal was listed as federally-endangered in 1967, and there has been a substantial net loss of habitat since that time. Historically, San Joaquin kit foxes occurred throughout California's Central Valley and adjacent foothills. Extensive land conversions in the Central Valley began as early as the mid-1800s with the Arkansas Reclamation Act. By the 1930's, the range of the kit fox had been reduced to the southern and western parts of the San Joaquin Valley (Grinnell *et al.* 1937). The primary factor contributing to this restricted distribution was the conversion of native habitat to irrigated cropland, industrial uses (e.g., hydrocarbon extraction), and urbanization (Laughrin 1970; Jensen 1972; Morrell 1972, 1975). Approximately one-half of the natural communities in the San Joaquin Valley were tilled or developed by 1958 (U.S. Fish and Wildlife Service 1980).

This rate of loss accelerated following the completion of the Central Valley Project and the State Water Project, which diverted and imported new water supplies for irrigated agriculture (U.S. Fish and Wildlife Service 1995a). Approximately 1.97 million acres of habitat, or about 66,000 acres per year, were converted in the San Joaquin region between 1950 and 1980 (California Department of Forestry and Fire Protection 1988). The counties specifically noted as having the highest wildland conversion rates included Kern, Tulare, Kings and Fresno, all of which are occupied by kit foxes. From 1959 to 1969 alone, an estimated 34 percent of natural lands were lost within the then-known kit fox range (Laughrin 1970).

By 1979, only approximately 370,000 acres out of a total of approximately 8.5 million acres on the San Joaquin Valley floor remained as non-developed land (Williams 1985; U.S. Fish and Wildlife Service 1980). Data from the California Department of Fish and Game (1985) and Service file information indicate that between 1977 and 1988, essential habitat for the blunt-nosed leopard lizard, a species that occupies habitat that is also suitable for kit foxes, declined by about 80 percent – from 311,680 acres to 63,060 acres, an average of about 22,000 acres per year (Biological Opinion for the Interim Water Contract Renewal, Service file 1-1-00-F-0056, February 29, 2000). Virtually all of the documented loss of essential habitat was the result of conversion to irrigated agriculture.

During 1990 to 1996, a gross total of approximately 71,500 acres of habitat were converted to farmland in 30 counties (total area 23.1 million acres) within the Conservation Program Focus area of the Central Valley Project. This figure includes 42,520 acres of grazing land and 28,854 acres of "other" land, which is predominantly comprised of native habitat. During this same time period, approximately 101,700 acres were converted to urban land use within the Conservation Program Focus area (California Department of Conservation 1994, 1996, 1998). This figure includes 49,705 acres of farmland, 20,476 acres of grazing land, and 31,366 acres of "other" land, which is predominantly comprised of native habitat. Because these assessments included a substantial portion of the Central Valley and adjacent foothills, they provide the best scientific and commercial information currently available regarding the patterns and trends of land conversion within the kit fox's geographic range. More than one million acres of suitable habitat

for kit foxes have been converted to agricultural, municipal, or industrial uses since the listing of the kit fox. In contrast, less than 500,000 acres have been preserved or are subject to community-level conservation efforts designed, at least in part, to further the conservation of the kit fox (U.S. Fish and Wildlife Service 1998).

Land conversions contribute to declines in kit fox abundance through direct and indirect mortalities, displacement, reduction of prey populations and denning sites, changes in the distribution and abundance of larger canids that compete with kit foxes for resources, and reductions in carrying capacity. Kit foxes may be buried in their dens during land conversion activities (C. Van Horn, Endangered Species Recovery Program, Bakersfield, personal communication to S. Jones, Fish and Wildlife Service, Sacramento, 2000), or permanently displaced from areas where structures are erected or the land is intensively irrigated (Jensen 1972; Morrell 1975). Furthermore, even moderate fragmentation or loss of habitat may significantly impact the abundance and distribution of kit foxes. Capture rates of kit foxes at the Naval Petroleum Reserve in Elk Hills were negatively associated with the extent of oil-field development after 1987 (Warrick and Cypher 1998). Likewise, the California Energy Commission found that the relative abundance of kit foxes was lower in oil-developed habitat than in nearby undeveloped habitat on the Lokern (Spiegel 1996). Researchers from both studies inferred that the most significant effect of oil development was the lowered carrying capacity for populations of both foxes and their prey species owing to the changes in habitat characteristics or the loss and fragmentation of habitat (Spiegel 1996; Warrick and Cypher 1998).

Dens are essential for the survival and reproduction of kit foxes that use them year-round for shelter and escape, and in the spring for rearing young. Hence, kit foxes generally have dozens of dens scattered throughout their territories. However, land conversion reduces the number of typical earthen dens available to kit foxes. For example, the average density of typical, earthen kit fox dens at the Naval Hills Petroleum Reserve was negatively correlated with the intensity of petroleum development (Zoellick *et al.* 1987), and almost 20 percent of the dens in developed areas were found to be in well casings, culverts, abandoned pipelines, oil well cellars, or in the banks of sumps or roads (U.S. Fish and Wildlife Service 1983). These results are important because the California Energy Commission found that, even though kit foxes frequently used pipes and culverts as dens in oil-developed areas of western Kern County, only earthen dens were used to birth and wean pups (Spiegel 1996). Similarly, kit foxes in Bakersfield use atypical dens, but have only been found to rear pups in earthen dens (Paul Kelly, Endangered Species Recovery Program, Fresno, California, personal communication to P. White, U.S. Fish and Wildlife Service, Sacramento, California April 6, 2000). Hence, the fragmentation of habitat and destruction of earthen dens could adversely affect the reproductive success of kit foxes. Furthermore, the destruction of earthen dens may also affect kit fox survival by reducing the number and distribution of escape refuges from predators.

Land conversions and associated human activities can lead to widespread changes in the availability and composition of mammalian prey for kit foxes. For example, oil field disturbances in western Kern County have resulted in shifts in the small mammal community from the primarily granivorous species that are the staple prey of kit foxes (Spiegel 1996), to

species adapted to early successional stages and disturbed areas (e.g., California ground squirrels)(Spiegel 1996). Because more than 70 percent of the diets of kit foxes usually consist of abundant rabbits (*Lepus*, *Sylvilagus*) and rodents (e. g., *Dipodomys* spp.), and kit foxes often continue to feed on their staple prey during ephemeral periods of prey scarcity, such changes in the availability and selection of foraging sites by kit foxes could influence their reproductive rates, which are strongly influenced by food supply and decrease during periods of prey scarcity (White and Garrott 1997, 1999).

Extensive habitat destruction and fragmentation have contributed to smaller, more-isolated populations of kit foxes. Small populations have a higher probability of extinction than larger populations because their low abundance renders them susceptible to stochastic (i.e., random) events such as high variability in age and sex ratios, and catastrophes such as floods, droughts, or disease epidemics (Lande 1988; Frankham and Ralls 1998; Saccheri *et al.* 1998). Similarly, isolated populations are more susceptible to extirpation by accidental or natural catastrophes because their recolonization has been hampered. These chance events can adversely affect small, isolated populations with devastating results. Extirpation can even occur when the members of a small population are healthy, because whether the population increases or decreases in size is less dependent on the age-specific probabilities of survival and reproduction than on raw chance (sampling probabilities). Owing to the probabilistic nature of extinction, many small populations will eventually lose out and go extinct when faced with these stochastic risks (Caughley and Gunn 1995).

Oil fields in the southern half of the San Joaquin Valley also continue to be an area of expansion and development activity. This expansion is reasonably certain to increase in the near future owing to market-driven increases in the price of oil. The cumulative and long-term effects of oil extraction activities on kit fox populations are not fully known, but recent studies indicate that moderate- to high-density oil fields may contribute to a decrease in carrying capacity for kit foxes owing to habitat loss or changes in habitat characteristics (Spiegel 1996; Warrick and Cypher 1998). There are no limiting factors or regulations that are likely to retard the development of additional oil fields. Hence, it is reasonably certain that development will continue to destroy and fragment kit fox habitat into the foreseeable future.

Competitive Interactions with Other Canids

Several species prey upon San Joaquin kit foxes. Predators (such as coyotes, bobcats, non-native red foxes, badgers, and golden eagles (*Aquila chrysaetos*) will kill kit foxes. Badgers, coyotes, and red foxes also may compete for den sites (U.S. Fish and Wildlife Service 1998). The diets and habitats selected by coyotes and kit foxes living in the same areas are often quite similar (Cypher and Spencer 1998). Hence, the potential for resource competition between these species may be quite high when prey resources are scarce such as during droughts, which are quite common in semi-arid, central California. Land conversions and associated human activities have led to changes in the distribution and abundance of coyotes, which compete with kit foxes for resources.

Coyotes occur in most areas with abundant populations of kit foxes and, during the past few decades, coyote abundance has increased in many areas owing to a decrease in ranching operations, favorable landscape changes, and reduced control efforts (Orloff *et al.* 1986; Cypher and Scrivner 1992; White and Ralls 1993; White *et al.* 1995). Coyotes may attempt to lessen resource competition with kit foxes by killing them. Coyote-related injuries accounted for 50-87 percent of the mortalities of radio collared kit foxes at Camp Roberts, the Carrizo Plain Natural Area, the Lokern Natural Area, and the Naval Petroleum Reserves (Cypher and Scrivner 1992; Standley *et al.* 1992; Ralls and White 1995; Spiegel 1996). Coyote-related deaths of adult foxes appear to be largely additive (i.e., in addition to deaths caused by other mortality factors such as disease and starvation) rather than compensatory (i.e., tending to replace deaths due to other mortality factors; White and Garrott 1997). Hence, the survival rates of adult foxes decrease significantly as the proportion of mortalities caused by coyotes increase (Cypher and Spencer 1998; White and Garrott 1997), and increases in coyote abundance may contribute to significant declines in kit fox abundance (Cypher and Scrivner 1992; Ralls and White 1995; White *et al.* 1996). There is some evidence that the proportion of juvenile foxes killed by coyotes increases as fox density increases (White and Garrott 1999). This density-dependent relationship would provide a feedback mechanism that reduces the amplitude of kit fox population dynamics and keeps foxes at lower densities than they might otherwise attain. In other words, coyote-related mortalities may dampen or prevent fox population growth, and accentuate, hasten, or prolong population declines.

Land-use changes also contributed to the expansion of non-native red foxes into areas inhabited by the San Joaquin kit fox. Historically, the geographic range of the red fox did not overlap with that of the kit fox. By the 1970's, however, introduced and escaped red foxes had established breeding populations in many areas inhabited by San Joaquin kit foxes (Lewis *et al.* 1993). The larger and more aggressive red foxes are known to kill kit foxes (Ralls and White 1995), and could displace them, as has been observed in the arctic when red foxes expanded into the ranges of smaller arctic foxes (Hersteinsson and Macdonald 1982). The increased abundance and distribution of nonnative red foxes will also likely adversely affect the status of kit foxes because they are closer morphologically and taxonomically, and would likely have higher dietary overlap than coyotes; potentially resulting in more intense competition for resources. Two documented deaths of kit foxes due to red foxes have been reported (Ralls and White 1995), and red foxes appear to be displacing kit foxes in the northwestern part of their range (Lewis *et al.* 1993). At Camp Roberts, red foxes have usurped several dens that were used by kit foxes during previous years (California Army National Guard, Camp Roberts Environmental Office, unpubl. data). In fact, opportunistic observations of red foxes in the cantonment area of Camp Roberts have increased 5-fold since 1993, and no kit foxes have been sighted or captured in this area since October 1997. Also, a telemetry study of sympatric red foxes and kit foxes in the Lost Hills area has detected spatial segregation between these species, suggesting that kit foxes may avoid or be excluded from red fox-inhabited areas (Paul Kelly, pers. comm. to P.J. White, April 6, 2000). Such avoidance would limit the resources available to local populations of kit foxes and possibly result in decreased fox abundance and distribution.

Disease

Wildlife diseases do not appear to be a primary mortality factor that consistently limits kit fox populations throughout their range (McCue and O'Farrell 1988; Standley and McCue 1992). However, central California has a high incidence of wildlife rabies cases (Schultz and Barrett 1991), and high seroprevalences of canine distemper virus and canine parvovirus indicate that kit fox populations have been exposed to these diseases (McCue and O'Farrell 1988; Standley and McCue 1992). Hence, disease outbreaks could potentially cause substantial mortality or contribute to reduced fertility in seropositive females, as was noted in the closely-related swift fox (*Vulpes velox*).

For example, there are some indications that rabies virus may have contributed to a catastrophic decrease in kit fox abundance at Camp Roberts, San Luis Obispo County, California, during the early 1990's. San Luis Obispo County had the highest incidence of wildlife rabies cases in California during 1989 to 1991, and striped skunks (*Mephitis mephitis*) were the primary vector (Barrett 1990; Schultz and Barrett 1991; Reilly and Mangiamele 1992). A rabid skunk was trapped at Camp Roberts during 1989 and two foxes were found dead due to rabies in 1990 (Standley *et al.* 1992). Captures of kit foxes during annual live trapping sessions at Camp Roberts decreased from 103 to 20 individuals during 1988 to 1991. Captures of kit foxes were positively correlated with captures of skunks during 1988 to 1997; suggesting that some factor(s) such as rabies virus was contributing to concurrent decreases in the abundances of these species. Also, captures of kit foxes at Camp Roberts were negatively correlated with the proportion of skunks that were rabid when trapped by County Public Health Department personnel two years previously. These data suggest that a rabies outbreak may have occurred in the skunk population and spread into the fox population. A similar time lag in disease transmission and subsequent population reductions was observed in Ontario, Canada, although in this instance the transmission was from red foxes to striped skunks (Macdonald and Voigt 1985).

Pesticides and Rodenticides

Pesticides and rodenticides pose a threat to kit foxes through direct or secondary poisoning. Kit foxes may be killed if they ingest rodenticide in a bait application, or if they eat a rodent that has consumed the bait. Even sublethal doses of rodenticides may lead to the death of these animals by impairing their ability to escape predators or find food. Pesticides and rodenticides may also indirectly affect the survival of kit foxes by reducing the abundances of their staple prey species.

For example, the California ground squirrel, which is the staple prey of kit foxes in the northern portion of their range, was thought to have been eliminated from Contra Costa County in 1975, after extensive rodent eradication programs. Field observations indicated that the long-term use of ground squirrel poisons in this county severely reduced kit fox abundance through secondary poisoning and the suppression of populations of its staple prey (Orloff *et al.* 1986).

Kit foxes occupying habitats adjacent to agricultural lands are also likely to come into contact with insecticides applied to crops owing to runoff or aerial drift. Kit foxes could be affected through direct contact with sprays and treated soils, or through consumption of contaminated

prey. Data from the California Department of Pesticide Regulation indicate that acephate, aldicarb, azinphos methyl, bendiocarb, carbofuran, chlorpyrifos, endosulfan, s-fenvalerate, naled, parathion, permethrin, phorate, and trifluralin are used within one mile of kit fox habitat. A wide variety of crops (alfalfa, almonds, apples, apricots, asparagus, avocados, barley, beans, beets, bok choy, broccoli, cantaloupe, carrots, cauliflower, celery, cherries, chestnuts, chicory, Chinese cabbage, Chinese greens, Chinese radish, collards, corn, cotton, cucumbers, eggplants, endive, figs, garlic, grapefruit, grapes, hay, kale, kiwi fruit, kohlrabi, leeks, lemons, lettuce, melons, mustard, nectarines, oats, okra, olives, onions, oranges, parsley, parsnips, peaches, peanuts, pears, peas, pecans, peppers, persimmons, pimentos, pistachios, plums, pomegranates, potatoes, prunes, pumpkins, quinces, radishes, raspberries, rice, safflower, sorghum, spinach, squash, strawberries, sugar beets, sweet potatoes, Swiss chard, tomatoes, walnuts, watermelons, and wheat), as well as buildings, Christmas tree plantations, commercial/industrial areas, greenhouses, nurseries, landscape maintenance, ornamental turf, rangeland, rights of way, and uncultivated agricultural and non-agricultural land, occur in close proximity to San Joaquin kit fox habitat.

Efforts have been underway to reduce the risk of rodenticides to kit foxes (U.S. Fish and Wildlife Service 1993). The Federal government began controlling the use of rodenticides in 1972 with a ban of Compound 1080 on Federal lands pursuant to Executive Order. Above-ground application of strychnine within the geographic ranges of listed species was prohibited in 1988. A July 28, 1992, biological opinion regarding the Animal Damage Control (now known as Wildlife Services) Program by the U.S. Department of Agriculture found that this program was likely to jeopardize the continued existence of the kit fox owing to the potential for rodent control activities to take the fox. As a result, several reasonable and prudent measures were implemented, including a ban on the use of M-44 devices, toxicants, and fumigants within the recognized occupied range of the kit fox. Also, the only chemical authorized for use by Wildlife Services within the occupied range of the kit fox was zinc phosphide, a compound known to be minimally toxic to kit foxes (U.S. Fish and Wildlife Service 1993).

Despite these efforts, the use of other pesticides and rodenticides still pose a significant threat to the kit fox, as evidenced by the death of 2 kit foxes at Camp Roberts in 1992 owing to secondary poisoning from chlorophacinone applied as a rodenticide, (Berry *et al.* 1992; Standley *et al.* 1992). Also, the livers of 3 kit foxes that were recovered in the City of Bakersfield during 1999 were found to contain detectable residues of the anticoagulant rodenticides chlorophacinone, brodifacoum, and bromadiolone (California Department of Fish and Game 1999).

To date, no specific research has been conducted on the effects of different pesticide or rodent control programs on the kit fox (U.S. Fish and Wildlife Service 1998). This lack of information is problematic because Williams (in litt., 1989) documented widespread pesticide use in known kit fox and Fresno kangaroo rat habitat adjoining agricultural lands in Madera County. In a separate report, Williams (in litt., 1989) documented another case of pesticide use near Raisin City in Fresno County, where treated grain was placed within an active Fresno kangaroo rat precinct. Also, farmers have been allowed to place bait on Bureau of Reclamation property to maximize the potential for killing rodents before they entered adjoining fields (Biological

Opinion for the Interim Water Contract Renewal, Service file 1-1-00-F-0056, February 29, 2000).

A September 22, 1993, biological opinion issued by the U.S. Fish and Wildlife Service to the Environmental Protection Agency (EPA) regarding the regulation of pesticide use (31 registered chemicals) through administration of the Federal Insecticide, Fungicide, and Rodenticide Act found that use of the following chemicals would likely jeopardize the continued existence of the kit fox: (1) aluminum and magnesium phosphide fumigants; (2) chlorophacinone anticoagulants; (3) diphacinone anticoagulants; (4) pival anticoagulants; (5) potassium nitrate and sodium nitrate gas cartridges; and (6) sodium cyanide capsules (U.S. Fish and Wildlife Service 1993).

Reasonable and prudent alternatives to avoid jeopardy included restricting the use of aluminum/magnesium phosphide, potassium/sodium nitrate within the geographic range of the kit fox to qualified individuals, and prohibiting the use of chlorophacinone, diphacinone, pival, and sodium cyanide within the geographic range of the kit fox, with certain exceptions (e.g., agricultural areas that are greater than 1 mile from any kit fox habitat)(U.S. Fish and Wildlife Service 1999).

Endangered Species Act Section 9 Violations and Noncompliance with the Terms and Conditions of Existing Biological Opinions

The intentional or unintentional destruction of habitat occupied by the San Joaquin kit fox is an issue of serious concern. Section 9 of the Act prohibits the "take" (e.g., harm, harass, pursue, injure, kill) of federally-listed wildlife species. "Harm" is further defined to include habitat modification or degradation that kills or injures wildlife by impairing essential behavioral patterns including breeding, feeding, or sheltering. Congress established two provisions (under sections 7 and 10 of the Act) that allow for the incidental take of listed species of wildlife by Federal agencies, non-Federal government agencies, and private parties. Incidental take is defined as take that is "...incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." If no permit is obtained for the incidental take of listed species, the individuals or entities responsible for these actions could be liable under section 9 of the Act if any unauthorized take occurs. There are numerous examples of section 9 violations and noncompliance with the terms and conditions of existing biological opinions.

Risk of Chance Extinction Owing to Small Population Size, Isolation, and High Natural Fluctuations in Abundance

Historically, kit foxes may have existed in a metapopulation structure of core and satellite populations, some of which periodically experienced local extinctions and recolonization (U.S. Fish and Wildlife Service 1998). Today's populations exist in an environment drastically different from the historic one, however, and extensive habitat fragmentation will result in geographic isolation, smaller population sizes, and reduced genetic exchange among populations; all of which increase the vulnerability of kit fox populations to extirpation. Populations of kit foxes are extremely susceptible to the risks associated with small population size and isolation because they are characterized by marked instability in population density. For example, the

relative abundance of kit foxes at the Naval Petroleum Reserves, California, decreased 10-fold during 1981 to 1983, increased 7-fold during 1991 to 1994, and then decreased 2-fold during 1995 (Cypher and Scrivner 1992; Cypher and Spencer 1998).

Many populations of kit fox are at risk of chance extinction owing to small population size and isolation. This risk has been prominently illustrated during recent, drastic declines in the populations of kit foxes at Camp Roberts and Fort Hunter Liggett. Captures of kit foxes during annual live trapping sessions at Camp Roberts decreased from 103 to 20 individuals during 1988 to 1991. This decrease continued through 1997 when only three kit foxes were captured (White *et al.* 2000). A similar decrease in kit fox abundance occurred at nearby Fort Hunter Liggett, and only 2 kit foxes have been observed on this installation since 1995 (L. Clark, Wildlife Biologist, Fort Hunter Liggett, pers. comm. to P. J. White, February 15, 2000). It is unlikely that the current low abundances of kit foxes at Camp Roberts and Fort Hunter Liggett will increase substantially in the near future owing to the limited potential for recruitment. The chance of substantial immigration is low because the nearest core population on the Carrizo Plain is distant (greater than 16 miles) and separated from these installations by barriers to kit fox movement such as roads, developments, and irrigated agricultural areas. Also, there is a relatively high abundance of sympatric predators and competitors on these installations that contribute to low survival rates for kit foxes and, as a result, may limit population growth (White *et al.* 2000). Hence, these populations may be on the verge of extinction.

The destruction and fragmentation of habitat could also eventually lead to reduced genetic variation in populations of kit foxes that are small and geographically isolated. Historically, kit foxes likely existed in a metapopulation structure of core and satellite populations, some of which periodically experienced local extinctions and recolonization (U.S. Fish and Wildlife Service 1998). Preliminary genetic assessments indicate that historic gene flow among populations was quite high, with effective dispersal rates of at least one to 4 dispersers per generation (M. Schwartz, University of Montana, Missoula, Montana, pers. comm. to P.J. White, March 23, 2000). This level of genetic dispersal should allow for local adaptation while preventing the loss of any rare alleles. Based on these results, it is likely that northern populations of kit foxes were once panmictic (i.e., randomly mating in a genetic sense), or nearly so, with southern populations. In other words, there were no major barriers to dispersal among populations.

Current levels of gene flow also appear to be adequate, however, extensive habitat loss and fragmentation continues to form more or less geographically distinct populations of foxes, which could potentially reduce genetic exchange among them. An increase in inbreeding and the loss of genetic variation could increase the extinction risk for small, isolated populations of kit foxes by interacting with demography to reduce fecundity, juvenile survival, and lifespan (Lande 1988; Frankham and Ralls 1998; Saccheri *et al.* 1998).

An area of particular concern is Santa Nella in western Merced County where pending development plans threaten to eliminate the little suitable habitat that remains and provides a dispersal corridor for kit foxes between the northern and southern portions of their range.

Preliminary estimates of expected heterozygosity from foxes in this area indicate that this population already may have reduced genetic variation. Other populations that may be showing the initial signs of genetic isolation are the Lost Hills area and populations in the Salinas-Pajaro River watershed (i.e., Camp Roberts and Fort Hunter Liggett). Preliminary estimates of the mean number of alleles per locus from foxes in these populations indicate that allelic diversity is lower than expected. Although these results may, in part, be due to the small number of foxes sampled in these areas, they may also be indicative of an increase in the amount of inbreeding due to population subdivision (M. Schwartz, pers. Comm. to P. J. White, March 23, 2000). Further sampling and analyses are necessary to adequately assess the effects of these potential genetic bottlenecks.

Arid systems are characterized by unpredictable fluctuations in precipitation, which lead to high frequency, high amplitude fluctuations in the abundance of mammalian prey for kit foxes (Goldingay *et al.* 1997; White and Garrott 1999). Because the reproductive and neonatal survival rates of kit foxes are strongly-depressed at low prey densities (White and Ralls 1993; White and Garrott 1997, 1999), periods of prey scarcity owing to drought or excessive rain events can contribute to population crashes and marked instability in the abundance and distribution of kit foxes (White and Garrott 1999). In other words, unpredictable, short-term fluctuations in precipitation and, in turn, prey abundance can generate frequent, rapid decreases in kit fox density that increase the extinction risk for small, isolated populations.

The primary goal of the recovery strategy for kit foxes identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (U.S. Fish and Wildlife 1998) is to establish a complex of interconnected core and satellite populations throughout the species' range. The long-term viability of each of these core and satellite populations depends partly upon periodic dispersal and genetic flow between them. Therefore, kit fox movement corridors between these populations must be preserved and maintained. In the northern range, from the Ciervo Panoche in Fresno County northward, kit fox populations are small and isolated, and have exhibited significant decline. The core populations are the Ciervo Panoche area, the Carrizo Plain area, and the western Kern County population. Satellite populations are found in the urban Bakersfield area, Porterville/Lake Success area, Creighton Ranch/Pixley Wildlife Refuge, Allensworth Ecological Reserve, Semitropic/Kern National Wildlife Refuge (NWR), Antelope Plain, eastern Kern grasslands, Pleasant Valley, western Madera County, Santa Nella, Kesterson NWR, and Contra Costa County. Major corridors connecting these population areas are on the east and west side of the San Joaquin Valley including the Millerton Lake area of Fresno County, around the bottom of the Valley, and cross-valley corridors in Kern, Fresno, and Merced counties.

From 1991 to 2000, the Service authorized incidental take for thirteen projects in Alameda, Contra Costa, San Joaquin, and Stanislaus Counties that have resulted in the loss or degradation of approximately 2,644 acres of San Joaquin kit fox habitat (U.S. Fish and Wildlife Service 2001). Compensation measures for these projects protected or will protect 3,016 acres of kit fox habitat within this area. However, much of these conservation measures are in the form of conservation easements, and for the most part, the lands are not actively managed for kit fox.

The Service also recently issued an incidental permit for projects occurring in San Joaquin County as identified in the San Joaquin Multi-species Open Space and Conservation Plan. Since the issuance of this section 10(a)(1)(B) permit in July of 2001, three projects within the kit fox corridor have been or are in the process of being permitted. These projects will impact approximately 204 acres of kit fox habitat. The San Joaquin County Council of Governments will purchase lands at a ratio of 3:1 for natural lands and 1:1 for disturbed lands to mitigate for these impacts. In 2002, the McDonald Kit Fox Preserve was acquired in southwest San Joaquin County, to compensate for impacts of current and future actions that will affect the kit fox (San Joaquin County 2003).

Although there have been sightings of kit fox in the northern range through the years by qualified biologists, population studies in this area have been limited. In 1982 and 1983, a family of kit foxes was radio collared and monitored near Bethany Reservoir (Hall 1983). From 1985 to 1989, kit fox surveys in the Kellogg Creek watershed found a total of 114 potential and possibly active dens, most of which were associated with ground squirrel colonies (Jones & Stokes Associates 1989).

The small size of the population and its isolation from other established populations make this northern most population vulnerable to extinction owing to predation and competition from coyotes and red foxes, inbreeding, catastrophic events, and disease epidemics (White *et al.* 2000). Genetic studies conducted by Schwartz *et al.* (2000) found that individuals in the Los Banos population near San Luis Reservoir only breed with animals in the northern population in Alameda and Contra Costa counties. Thus, projects in Alameda and Contra Costa County that significantly reduce travel corridors and population size could potentially impact the Los Banos kit fox population. The long term viability of both populations depends, at least in part, on periodic immigration and gene flow from between the populations.

Habitat in the northern range is highly fragmented by highways, canals, and development. Interstate 580 runs southeast to northwest as it splits from Interstate 5, and turns west through the Altamont Pass area; thus it impedes both north-south and west-east movement of San Joaquin kit foxes. Although the canal system facilitates north-south migration along its length, it also impedes lateral east-west kit fox travel. Recent development proposals, including those described above, will further impede the movement of kit fox and isolate the northern population from more southern populations. These and other developments are slowly diminishing the last remaining kit fox habitat, and development pressures are expected to increase in the future (see *Cumulative Effects* section of this biological opinion). The protection of the remaining travel corridor, including grasslands west of Interstate 580, and lands between the California aqueduct and the Delta Mendota Canal, is vital to the survival of this population.

Suitable kit fox habitat in the form of grasslands is abundant in the action area, and contiguous within a 10-mile radius of the project (California Department of Transportation 2002). There is an abundance of grassland habitat and ground squirrels, which provide dens and a prey base (Nagano pers. obs. November 2004; California Department of Transportation 2004). According to the California Department of Transportation (2004), signs of smaller rodents were also noted

at the entrances of dens; they also reported other prey species of the San Joaquin kit fox in the form of the western fence lizards (*Sceloporus occidentalis*), black-tailed jack rabbits, and snakes. Several squirrel dens appeared to be enlarged by another animal (California Department of Transportation 2004). The San Joaquin kit fox has been documented to enlarge and utilize ground squirrel burrows. In addition, individuals of this species have been recorded to move as far as 9 miles or more in a single night (U.S. Fish and Wildlife Service 1998). The closest kit fox sighting to the proposed project is approximately 5 miles from the project site. There are no obvious natural barriers that would prevent kit fox movement within a 10-mile radius. Therefore, the Service believes that the San Joaquin kit fox is reasonably certain to occur within the action area because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the project, as well as the nearby observations of this listed species.

California Tiger Salamander

The final rule listing the California tiger salamander as a threatened species was published on August 4, 2004 (U.S. Fish and Wildlife 2004).

The California tiger salamander is a large, stocky, terrestrial salamander with a broad, rounded snout. Adults may reach a total length of 8.2 inches (Petranka 1998; Stebbins 2003). California tiger salamanders exhibit sexual dimorphism; males tend to be larger than females. The coloration of the California tiger salamander is white or yellowish markings against black. As adults, California tiger salamanders tend to have the creamy yellow to white spotting on the sides with much less on the dorsal surface of the animal, whereas other tiger salamander species have brighter yellow spotting that is heaviest on the top of the animals.

Historically, the California tiger salamander inhabited low elevation grassland and oak savanna plant communities of the Central Valley, and adjacent foothills, and the inner coast ranges in California (Jennings and Hayes 1994; Storer 1925; Shaffer *et al.* 1993). The species occurs from near sea level up to approximately 3900 feet in the coast ranges and up to about 1600 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. In the Central Valley and surrounding foothills, the species occurred from northern Yolo County southward to northwestern Kern County and northern Tulare County.

The California tiger salamander has an obligate biphasic life cycle (Shaffer *et al.* 2004). Although the larvae salamanders develop in the vernal pools and ponds in which they were born, they are otherwise terrestrial salamanders that spend most of their postmetamorphic lives in widely dispersed underground retreats (Shaffer *et al.* 2004; Trenham *et al.* 2001). Subadult and adult California tiger salamanders spend the dry summer and fall months of the year in the burrows of small mammals, such as California ground squirrels and Botta's pocket gopher (*Thomomys bottae*) (Storer 1925; Loredó and Van Vuren 1996; Petranka 1998; Trenham 1998a). Camel crickets and other invertebrates within these burrows likely are prey for California tiger salamanders, as well as protection from the sun and wind associated with the dry California climate that can cause desiccation (drying out) of amphibian skin. Although California tiger salamanders are members of a family known as "burrowing salamanders," California tiger

salamanders are not known to create their own burrows in the wild, perhaps due to the hardness of soils in the California ecosystems in which they are found. Because they live underground in the burrows of mammals, they are rarely encountered by humans even where they are abundant. The burrows may be active or inactive, but because they collapse within approximately 18 months if not maintained, an active population of burrowing mammals is necessary to sustain

sufficient underground refugia for the species (Loredo *et al.* 1996). California tiger salamanders also may utilize leaf litter or desiccation cracks in the soil.

The upland burrows inhabited by California tiger salamanders have often been referred to as "estivation" sites, which implies a state of inactivity, however, recent studies show that the animals move, feed, and remain active in their burrows (Trenham 2001; Van Hattem 2004). Researchers have long inferred that they are feeding while underground because the animals arrive at breeding ponds in good condition and are heavier when entering a pond than when leaving. Thus, upland habitat is a more accurate description of the terrestrial areas used by California tiger salamanders.

Once fall or winter rains begin, the salamanders emerge from the upland sites on rainy nights to feed and to migrate to the breeding ponds (Stebbins 1985, 1989; Shaffer *et al.* 1993). Adult salamanders mate in the breeding ponds, after which the females lay their eggs in the water (Twitty 1941; Shaffer *et al.* 1993; Petranka 1998). Historically, the California tiger salamander utilized vernal pools, but the animals also currently breed in livestock stockpools. 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). In ponds with no or limited vegetation, they may be attached to objects, such as rocks and boards on the bottom (Jennings and Hayes 1994). After breeding, adults leave the pool and return to the small mammal burrows (Loredo *et al.* 1996; Trenham 1998a), although they may continue to come out nightly for approximately the next two weeks to feed (Shaffer *et al.* 1993). In drought years, the seasonal pools may not fill and the adults can not breed (Barry and Shaffer 1994).

Salamander eggs hatch in ten to 14 days with newly hatched larvae salamanders ranging from 0.45 to 0.56 inch in total length (Petranka 1998). The larvae are aquatic. They are yellowish gray in color and have broad flat heads, possess large, feathery external gills, and broad dorsal fins that extend well onto 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 smaller tadpoles of Pacific treefrogs (*Pseudacris regilla*) and California red-legged frogs (*Rana aurora*) (J. Anderson 1968; P. Anderson 1968). The larvae are among the top aquatic predators in the seasonal pool ecosystems. They often rest on the bottom in shallow water, but also may be found at different layers in the water column in deeper water. The young salamanders are wary and when approached by potential predators, will dart into vegetation on the bottom of the pool (Storer 1925).

The larval stage of the California tiger salamander usually last three to six months, as most seasonal ponds and pools dry up during the summer (Petranka 1998). 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). Individuals collected near Stockton in the Central Valley during April varied from 1.88 to 2.32 inches in length (Storer 1925). Feaver (1971) found that larvae metamorphosed and left the breeding pools 60 to 94 days after the eggs had been laid, with larvae developing faster in smaller, more rapidly drying pools. The longer the ponding duration, the larger the larvae and metamorphosed juveniles are able to grow, and the more likely they are to survive and reproduce (Pechmann *et al.* 1989; Semlitsch *et al.* 1988; Morey 1998; Trenham 1998b). The larvae will perish if a site dries before metamorphosis is complete (P. Anderson 1968; Feaver 1971). Pechmann *et al.* (1988) found a strong positive correlation with ponding duration and total number of metamorphosing juveniles in five salamander species. In Madera County, Feaver (1971) found that only 11 of 30 pools sampled supported larval California tiger salamanders, and 5 of these dried before metamorphosis could occur. Therefore, out of the original 30 pools, only six (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). In the late spring or early summer, before the ponds dry completely, metamorphosed juveniles leave them and enter upland habitat. This emigration occurs in both wet and dry conditions (Loredo and Van Vuren 1996; Loredo *et al.* 1996). Unlike during their winter migration, the wet conditions that California tiger salamanders prefer do not generally occur during the months when their breeding ponds begin to dry. As a result, juveniles may be forced to leave their ponds on rainless nights. Under these conditions, they may move only short distances to find temporary upland sites for the dry summer months, waiting until the next winter's rains to move further into suitable upland refugia. Once juvenile California tiger salamanders leave their birth ponds for upland refugia, they typically do not return to ponds to breed for an average of 4 to 5 years. However, they remain active in the uplands, coming to the surface during rainfall events to disperse or forage (Trenham and Shaffer, unpublished manuscript).

Lifetime reproductive success for California and other tiger salamanders is low. Trenham *et al.* (2000) found the average female bred 1.4 times and produced 8.5 young that survived to metamorphosis per reproductive effort. This resulted in roughly 11 metamorphic offspring over the lifetime of a female. Two reasons for the low reproductive success are the preliminary data suggest that most individuals of the California tiger salamanders require two years to become sexually mature, but some individuals may be slower to mature (Shaffer *et al.* 1993); and some animals do not breed until they are four to six years old. While individuals may survive for more than ten years, many breed only once, and in some populations, less than 5 percent of marked juveniles survive to become breeding adults (Trenham 1998b). With such low recruitment, isolated populations are susceptible to unusual, randomly occurring natural events as well as from 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). Following breeding, adult California tiger salamanders return to upland habitats, where they may live for one or more years before breeding again (Trenham *et al.* 2000).

California tiger salamanders are known to travel large distances from breeding ponds into upland habitats. Maximum distances moved are generally difficult to establish for any species, but California tiger salamanders in Santa Barbara County have been recorded to disperse 1.3 miles from breeding ponds (Sweet 1998). California tiger salamanders 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 ponds approximately 1,900 and 2,200 feet away (Trenham *et al.* 2001). In addition to traveling long distances during migration to or dispersal from ponds, California tiger salamanders may reside in burrows that are far from ponds. At one site in Contra Costa County, hundreds of California tiger salamanders have been captured three years in a row in upland habitat approximately 0.75 mile from the nearest breeding pond (Orloff 2003).

Although the observations above show that California tiger salamanders can travel far, typically they stay closer to breeding ponds. Evidence suggests that juvenile California tiger salamanders disperse further into upland habitats than adult California tiger salamanders. A trapping study conducted in Solano County during winter of 2002/2003 found that juveniles used upland habitats further from breeding ponds than adults (Trenham and Shaffer in press). More juvenile salamanders were captured at distances of 328, 656, and 1,312 feet from a breeding pond than at 164 feet. Large numbers, approximately 20 percent of total captures, were found 1,312 feet from a breeding pond. Fitting a distribution curve to the data revealed that 95 percent of juvenile salamanders could be found 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 detected juvenile California tiger salamanders at even further distances, with a large proportion of the total salamanders caught at 2,297 feet from the breeding pond (Trenham *et al.*, unpublished data). Surprisingly, most juveniles captured, even those at 2100 feet, were still moving away from ponds (Ben Fitzpatrick, University of California at Davis, pers. comm. 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, radio-equipped adult California tiger salamanders were tracked to burrows 62 to 813 feet from their breeding ponds (Trenham 2001). These reduced movements may be due to adult California tiger salamanders having depleted physical reserves post-breeding, or also due to the drier weather conditions that can occur during the period when adults leave the ponds.

In addition, rather than staying in a single burrow, most individuals used several successive burrows at increasing distances from the pond. Although the studies discussed above provide an approximation of the distances that California tiger salamanders regularly move from their breeding ponds, upland habitat features will drive the details of movements in a particular

landscape. Trenham (2001) found that radio-tracked adults favored grasslands with scattered large oaks, over more densely wooded areas. A drift-fence survey at a Santa Barbara County pond that is bordered by a strawberry field found that many emigrating juveniles moved towards the strawberry field; however, no adults were captured entering the pond from this direction. Most of the California tiger salamanders entered the pond from extensive, overgrazed grassy flats rather than sandhill or eucalyptus habitats in other quadrants (Steve Sykes, University of California at Santa Barbara, unpublished data 2003). Based on radio-tracked adults, there is no indication that certain habitat types are favored as corridors for terrestrial movements (Trenham 2001). In addition, at two ponds completely encircled by drift fences and pitfall traps, captures of arriving adults and dispersing new metamorphs were distributed roughly evenly around the ponds. Thus, it appears that dispersal into the terrestrial habitat occurs randomly with respect to direction and habitat types.

Several species prey have either been documented or likely prey upon the California tiger salamander including coyotes (*Canis latrans*), raccoons (*Procyon lotor*), opossums (*Didelphis virginiana*), egrets (*Egretta* species), great blue herons (*Ardea herodias*), crows (*Corvus brachyrhynchos*), ravens (*Corvus corax*), bullfrogs (*Rana catesbeiana*), mosquito fish (*Gambusia affinis*), and crayfish (*Procambarus* species). Domestic dogs (*Canis familiaris*) have been observed eating California tiger salamanders at Lake Lagunitas at Stanford University (Sean Barry, ENTRIX, pers. comm. to C. Nagano July 2004).

The California tiger salamander is imperiled throughout its range by a variety of human activities (U.S. Fish and Wildlife Service 2004). Current factors associated with declining populations of the salamander include continued degradation and loss of habitat due to agriculture and urbanization, hybridization with non-native eastern tiger salamanders (*Ambystoma tigrinum*) (Fitzpatrick and Shaffer 2004; Riley *et al.* 2003), and introduced predators. Fragmentation of existing habitat and the continued colonization of existing habitat by non-native tiger salamanders (*Ambystoma tigrinum* and other species) may represent the most significant current threats to California tiger salamanders, although populations are likely threatened by more than one factor. Isolation and fragmentation of habitats 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 are predation and competition from introduced exotic species; possible commercial overutilization; disease; various chemical contaminants; road-crossing mortality; and certain unrestrictive mosquito and rodent control operations. The various primary and secondary threats are not currently being offset by existing Federal, State, or local regulatory mechanisms. The California tiger salamander also is vulnerable to chance environmental or demographic events, to which small populations are particularly vulnerable.

Thirty-one percent (221 of 711 records and occurrences) of all Central California tiger salamander records and occurrences are 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, most of them are in eastern Alameda and Santa Clara counties (Buckingham in litt. 2003; California Department of Fish and Game 2003; U.S.

Fish and Wildlife Service 2004). Thirteen of these records in the Bay Area region are considered extirpated or likely to be extirpated by the California Department of Fish and Game (2003).

The East Bay and Livermore Valley areas have undergone intensive urban development in recent years (California Department of Conservation 1996, 1998, 2000, 2002). The total human population of the counties in the Bay Area Region increased by approximately 17 percent between 1990 and 2000 (4.5 million people to 5.3 million people) (California Department of Forestry 1998). Most of the California tiger salamander natural historic habitat (vernal pool grasslands) available in this region has been lost due to urbanization and conversion to intensive agriculture (Keeler-Wolf *et al.* 1998). California tiger salamanders are now primarily restricted to artificial breeding ponds, such as bermed ponds or stock ponds which are typically located at higher elevations (California Department of Fish and Game 2003).

Of 140 California tiger salamander localities where wetland type was identified, only 7 percent were located in vernal pools (California Department of Fish and Game 2003). The Bay Area region occurs within the Central Coast and Livermore vernal pool regions (Keeler-Wolf *et al.* 1998). Vernal pools within the Coast Range are more sporadically distributed than vernal pools in the Central Valley (Holland 2003). In San Benito and Santa Clara counties, Central Coast vernal pools have been destroyed and degraded due to agriculture. The vernal pools at Stanford in Santa Clara County have been destroyed and degraded due to recreation and development (Keeler-Wolf *et al.* 1998). The annual loss of vernal pools from 1994 to 2000 in Monterey, San Benito, San Luis Obispo, Santa Barbara, and Ventura counties was 2 to 3 percent; this rate of loss suggests that vernal pools in these counties are disappearing faster than previously reported (Holland 2003). Most of the vernal pools in the Livermore Region in Alameda County have been destroyed or degraded by urban development, agriculture, water diversions, and poor water quality, and long-term overgrazing (Keeler-Wolf *et al.* 1998). During the 1980s and 1990s, vernal pools were lost at a 1.1 percent annual rate in Alameda County (Holland 1998).

Due to the extensive losses of vernal pool complexes and their limited distribution in the Bay Area region, many California tiger salamander breeding sites consist of artificial water bodies. Overall, 89 percent (124) of the records for which the water body was identified are in stock, farm, or berm ponds used by cattle grazing and as a temporary source of water for small farm irrigation (California Department of Fish and Game 2003), possibly placing California tiger salamanders at great risk of hybridization with non-native tiger salamanders especially in Santa Clara and San Benito counties. Without long-term maintenance the longevity of these artificial breeding habitats is also much shorter than their natural breeding habitat, which are vernal pools (Shaffer *in litt.* 2003).

Shaffer *et al.* (1993) found that the East Bay counties of Alameda and Contra Costa supported the greatest concentrations of California tiger salamander. California tiger salamander populations in the Livermore Valley are severely threatened by the ongoing conversion of grazing land to subdivisions and vineyards (Stebbins 1989; East Bay Regional Park District 1999). One project within Alameda County in the Bay Area region that may affect California tiger salamander totals 700 acres (East Bay Regional Parks District 2003). Projects that are likely to threaten California tiger salamanders in the Bay Area region include one in Alameda

County totaling 310 acres, two in San Joaquin County totaling 12,427 acres and one in Santa Clara County totaling 19 acres.

Larvae California tiger salamander were observed in the large pool designated as Site 1 in the fairy shrimp survey (URS 2003), and there are numerous recent sightings in this area recorded in the California Natural Diversity Data Base (California Department of Fish and Game 2004). Suitable salamander breeding habitat also exists in a 60-acre mitigation site for the California red-legged frog and the California tiger salamander at the east end of the project area and north of State Route 84. The site was established to mitigate for impacts resulting from the Ruby Hills and Vineyard Estates subdivision. Juvenile salamanders were observed during fairy shrimp surveys in seasonal pools within the action area. Suitable California tiger salamander habitat in the form of grasslands is abundant in the action area (Nagano pers. obs. November 2004; California Department of Transportation 2002). There is an abundance of ground squirrels, whose burrows provide underground upland habitat for the amphibian (Nagano pers. obs. November 2004; California Department of Transportation 2004). Therefore, the Service has determined it is reasonable to conclude the California tiger salamander inhabits the action area, based on the biology and ecology of the species, the presence of suitable habitat, as well as the recent observations of this animal.

California Tiger Salamander Proposed Critical Habitat

Critical habitat for the California tiger salamander was proposed on August 10, 2004 (U.S. Fish and Wildlife Service 2004). The Service divided the current range of the Central population into four regions: (1) Central Valley; (2) Southern San Joaquin Valley; (3) East Bay; and (4) Central Coast. The project area is located in the East Bay region.

The Service determined that conserving the California tiger salamander over the long-term requires a five-pronged approach: (1) Maintaining the current genetic structure across the species range; (2) maintaining the current geographical, elevational, and ecological distribution; (3) protecting the hydrology and water quality of breeding pools and ponds; (4) retaining or providing for connectivity between locations for genetic exchange and recolonization; (5) protecting sufficient barrier-free upland habitat around each breeding location to allow for sufficient survival and recruitment to maintain a breeding population over the long-term (U.S. Fish and Wildlife Service 2004).

The Service believes that areas proposed for critical habitat may require certain management considerations or protections due to the following threats: (1) Activities that introduce or promote the occurrence of bullfrogs and fish; (2) Activities that could disturb aquatic habitats during the breeding season; (3) Activities that impair the water quality of aquatic breeding habitats; (4) Activities that would reduce small mammal populations to the point that there is insufficient underground Central population refugia used for foraging, protection from predators, and shelter from the elements; (5) Activities that create barriers impassible for salamanders or road crossings that increase mortality in upland habitat between extant occurrences in breeding habitat; (6) Activities on adjacent uplands that disrupt vernal pool complexes' ability to support California tiger salamander breeding function; (7) Activities that introduce non-native tiger

salamanders in areas where the California tiger salamander is threatened with hybridization (U.S. Fish and Wildlife Service 2004).

In determining which areas to designate as critical habitat, the Service considers those physical and biological features (primary constituent elements) that are essential to the conservation of the species, and that may require special management considerations and protection (50 CFR § 424.14). The Service lists the known primary constituent elements together with the proposed critical habitat description. Such physical and biological features include, but are not limited to, space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, rearing (or development) of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

The primary constituent elements for the California tiger salamander are aquatic and upland areas, including vernal pool complexes, where suitable breeding and non-breeding habitats are interspersed throughout the landscape, and are interconnected by continuous dispersal habitat. All areas proposed as critical habitat for the central population contain one or more of the primary constituent elements (U.S. Fish and Wildlife Service 2004).

Breeding Habitat. Standing bodies of fresh water, including natural and man-made (e.g. stock) ponds, vernal pools, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a sufficient length of time necessary for the species to complete its life cycle (U.S. Fish and Wildlife Service 2004).

Breeding California tiger salamander are found in vernal pools, vernal pool complexes, and seasonal ponds in associated annual grasslands, oak savannah, and coastal bay scrub plant communities of the Bay Area (Santa Clara Valley), Central Coast, Central Valley, and Southern San Joaquin Valley. The California tiger salamander also have adapted to using artificial water bodies, such as stock ponds during their aquatic phase. However, stockponds are often not optimum breeding habitat because the hydroperiod is so short there is not sufficient time for larvae to metamorphose, or it is so long that predatory fish and bullfrogs can colonize the pond. Permanent wetlands can support breeding California tiger salamander if fish are not present, but extirpation of the salamander is likely to occur if fish are introduced. Periodic maintenance to remove silt from stockponds and other artificial waterbodies may also cause a temporary loss of functioning aquatic habitat. Regardless of vernal pool, pond, or seasonal wetland type, successful breeding ponds for California tiger salamander need to be inundated for a minimum of 21 weeks to allow for successful metamorphosis (U. S. Fish and Wildlife Service 2004).

Non-Breeding Habitat. California tiger salamanders spend the majority of their lives in barrier-free upland habitats adjacent to breeding ponds. Within these upland habitats, adult California tiger salamander spend part of their lives in the underground burrows of mammals, especially the burrows of the California ground squirrel and valley pocket gopher, with depths ranging from 20 centimeters to 1 meter beneath the ground surface. Small mammals are essential in creating the underground habitat that adult California tiger salamander depend on for food, shelter, and

protection from the elements and from predation. Although California tiger salamanders are members of a family of burrowing tiger salamanders, California tiger salamanders are not known to create their own burrows in the wild and require small mammal burrows for survival. The upland component of the Central population habitat typically consists of vernal pool grassland or grassland savannah with scattered oak trees. However, some occupied California tiger salamander breeding ponds exist within mixed grassland and woodland habitats, in woodlands, scrub, or chaparral habitats (U.S. Fish and Wildlife Service 2004).

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 (on average, four years). Upon reaching sexual maturity, most individuals return to their natal (birth) pond to breed, while 20 percent disperse to other ponds (U. S. Fish and Wildlife Service 2004).

Essential dispersal habitats generally consist of upland areas adjacent to essential aquatic habitats which are not isolated from other essential aquatic habitats by barriers that California tiger salamanders cannot cross. Essential dispersal habitats provide connectivity among California tiger salamander suitable aquatic and upland habitats. While 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 (U. S. Fish and Wildlife Service 2004).

The Service proposed critical habitat that allowed for dispersal between extant occurrences within 0.7 mile of each other. This distance was selected because it provides for 99 percent of the chances that individual salamanders can move and breed between extant occurrences, and, thereby, provides for genetic exchange between individuals within the region (U.S. Fish and Wildlife Service 2004).

The proposed Pigeon Pass Project is located in Unit 3 of critical habitat proposed by the Service (U.S. Fish and Wildlife Service 2004b). The project area is relatively undeveloped, with the highway corridor, the Ruby Hills and Vineyard Estates developments, and several ranches in the project vicinity. The surrounding habitat includes several vegetation communities, including valley oak woodland, annual non-native grassland, seasonally wetted areas with associated vegetation, and ponds. A 60-acre California red-legged frog/California tiger salamander mitigation site for the Ruby Hills/Vineyard Estates consists of a series of artificial ponds connected by drainages, and the surrounding upland habitat. As described in the Biological Assessment, essentially all undeveloped lands on and adjacent to the action area contain the constituent elements of proposed California tiger salamander critical habitat, including aquatic habitat, associated uplands, and dispersal habitat.

California Red-Legged Frog

The California red-legged frog was listed as a threatened species on May 23, 1996, (U.S. Fish and Wildlife Service 1996). Please refer to the final rule and the *Recovery Plan for the California Red-Legged Frog (Rana aurora draytonii)* (U.S. Fish and Wildlife Service 2002) for additional information on this species.

This species 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 1985). 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 1985), 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). Female frogs deposit egg masses on emergent vegetation so that the egg mass floats on the surface of the water (Hayes and Miyamoto 1984). California red-legged frogs breed from November through March with earlier breeding records occurring in southern localities (Storer 1925). 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.

The historic range of the red-legged frog extended coastally from the vicinity of Point Reyes National Seashore, Marin County, California, and inland from the vicinity of Redding, Shasta County, California, southward to northwestern Baja California, Mexico (Jennings and Hayes 1985; Hayes and Krempels 1986). The California Red-legged frog was historically documented with 46 counties but the taxa now remains in 238 streams or drainages within 23 counties, representing a loss of 70 percent of its former range (U.S. Fish and Wildlife Service 2002). 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 (California Department of Fish and Game 2002).

California red-legged frogs have been extirpated or nearly extirpated from over 70 percent of their former range. Historically, this species was found throughout the Central Valley and Sierra Nevada foothills. As of 1996, California red-legged frogs have been documented in approximately 240 streams or drainages from 23 counties, primarily in central coastal California. Monterey, San Luis Obispo, and Santa Barbara counties support the largest extent of currently occupied habitat. The most secure aggregations of California red-legged frogs are found in aquatic sites that support substantial riparian and aquatic vegetation and lack non-native predators.

Adult California red-legged frogs prefer dense, shrubby or emergent riparian vegetation closely associated with deep (>2.3 feet), still, or slow-moving water (Hayes and Jennings 1988).

However, frogs also have been found in ephemeral creeks and drainages and in ponds that may or may not have riparian vegetation. The largest densities of California red-legged frogs currently are associated with deep pools with dense stands of overhanging willows (*Salix* spp.) and an intermixed fringe of cattails (*Typha latifolia*) (Jennings 1988). California red-legged frogs disperse upstream and downstream of their breeding habitat to forage and seek sheltering habitat. 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 ricks may also be used. Incised stream channels with portions narrower than 46 centimeters (18 inches) and depths greater than 46 cm (18 in) may also provide important summer sheltering habitat. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting frog population numbers and survival. During winter rain events, juvenile and adult California red-legged frogs are known to disperse up to 0.54-1.08 miles (Rathbun and Holland, unpublished data, cited in Rathbun *et al.* 1997). Dispersing frogs in northern Santa Cruz County traveled distances from 0.25 mile to more than 2 miles without apparent regard to topography, vegetation type, or riparian corridors (Bulger, unpublished data).

Egg masses 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 (*Scirpus* spp.) or cattails (Jennings *et al.* 1992). California red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Eggs hatch in 6 to 14 days (Jennings 1988). In coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity (Jennings *et al.* 1992); eggs exposed to salinity levels greater than 4.5 parts per thousand result in 100 percent mortality (Jennings and Hayes 1990). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis 3.5 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 percent 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). Populations of California red-legged frogs fluctuate from year to year. When conditions are favorable California red-legged frogs can experience extremely high rates of reproduction and thus produce large numbers of dispersing young and a concomitant increase in the number of occupied sites. In contrast, California red-legged frogs may temporarily disappear from an area when conditions are stressful (e.g., drought).

The diet of California red-legged frogs is highly variable. Hayes and Tennant (1985) found invertebrates to be the most common food items. Vertebrates, such as Pacific tree frogs (*Hyla regilla*) and California mice (*Peromyscus californicus*), represented over half the prey mass eaten by larger frogs (Hayes and Tennant 1985). Hayes and Tennant (1985) found juvenile frogs to be active diurnally and nocturnally, whereas adult frogs were largely nocturnal. Feeding activity probably occurs along the shoreline and on the surface of the water (Hayes and Tennant 1985). Tadpoles likely eat algae (Jennings *et al.* 1992).

Several researchers in central California have noted the decline and eventual local disappearance of California and northern red-legged frogs in systems supporting bullfrogs (*Rana catesbeiana*) (Jennings and Hayes 1990; Twedt 1993), red swamp crayfish (*Procambarus clarkii*), signal crayfish (*Pacifastacus leniusculus*), and several species of warm water fish including sunfish (*Lepomis* spp.), goldfish (*Carassius auratus*), common carp (*Cyprinus carpio*), and mosquitofish (*Gambusia affinis*) (L. Hunt, in litt. 1993; S. Barry, in litt. 1992; S. Sweet, in litt. 1993). Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the California red-legged frog throughout its range.

Several researchers in central California have noted the decline and eventual disappearance of California red-legged frog populations once bullfrogs became established at the same site (L. Hunt, in litt. 1993; S. Barry, in litt. 1992; S. Sweet, in litt. 1993). This has been attributed to both predation and competition. Twedt (1993) documented bullfrog predation of juvenile northern red-legged frogs (*Rana aurora aurora*), 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; 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). In addition to competition, bullfrogs also interfere with California red-legged frog reproduction. Both California and northern red-legged frogs have been observed in amplexus with (mounted on) both male and female bullfrogs (Jennings and Hayes 1990; Twedt 1993; M. Jennings, in litt. 1993; R. Stebbins in litt. 1993). Thus bullfrogs are able to prey upon and out-compete California red-legged frogs, especially in sub-optimal habitat. The urbanization of land within and adjacent to California red-legged frog habitat has also impacted California red-legged frogs. These declines are attributed to channelization of riparian areas, enclosure of the channels by urban development that blocks California red-legged frog dispersal, and the introduction of predatory fishes and bullfrogs. This report further identifies the conversion and isolation of perennial pool habitats resulting from urbanization as an ongoing impact to California red-legged frogs.

The recovery plan for the California red-legged frog identifies eight recovery units. Each recovery unit reflects areas with similar conservation needs. The strategy for recovery of California red-legged frogs includes promoting and protecting populations that are geographically distributed in a manner that allows for the continued existence of viable metapopulations. The California red-legged frog has been extirpated or nearly extirpated from over 70 percent of their former range. Historically, this species was found throughout the Central Valley and Sierra Nevada foothills. As of 1996, California red-legged frogs have been documented in approximately 240 streams or drainages from 23 counties, primarily in central coastal California. Monterey, San Luis Obispo, and Santa Barbara counties support the largest extent of currently occupied habitat. The most secure aggregations of California red-legged frogs are found in aquatic sites that support substantial riparian and aquatic vegetation and lack non-native predators.

This project is located within the East San Francisco Bay Recovery Unit, which extends from the northernmost portion of Contra Costa County, includes a portion of San Joaquin County south to

Santa Clara County, includes the eastern portion of San Mateo County, and all of San Francisco County (U. S. Fish and Wildlife Service 2002). Contra Costa and Alameda counties contain the majority of known California red-legged frog localities within the eastern San Francisco Bay area. Within this recovery unit, the listed amphibian seem to have been nearly eliminated from the western lowland areas near urbanization, they still occur in isolated populations in the East Bay Foothills (between Interstate 580 and Interstate 680), and are abundant in several areas in the eastern portions of Alameda and Contra Costa counties. This recovery unit is essential to the survival and recovery of California red-legged frogs, as it contains the largest number of occupied drainages in the northern portion of its range. The eastern and western edges of this area are heavily urbanized and the northern and southern edges are bounded by major highways. However, there are numerous small drainages flowing underneath both Interstate 580 and Highway 84 that California red-legged frogs could disperse through. Therefore, this area is connected to other populations of red-legged frogs in the foothills of central Alameda and Contra Costa Counties and the populations found in eastern Alameda County. Within this area, the species historically bred in several ponds and drainages within the proposed project area, Garin/Dry Creek Regional Park, Pleasanton Ridge Regional Park, and Sinbad Creek.

There are several recent sightings of the California red-legged frog in the action area and throughout the region south of Livermore (California Department of Fish and Game 2004; California Department of Transportation 2004). Surveys for the vernal pool fairy shrimp conducted by California Department of Transportation in the Pigeon Pass Project action area detected California red-legged frog egg masses (California Department of Transportation 2004). Habitat of this listed species occurs along the entire Pigeon Pass Project corridor, and includes several drainage crossings. Adult California red-legged frogs are highly mobile and may move considerable distances from their breeding ponds. Areas containing aquatic and upland habitat exist within and adjacent to the action area (Nagano pers. obs. November 2004). The action area contains components that can be used by the California red-legged frog for feeding, resting, mating, movement corridors, and other essential behaviors. Therefore, the Service believes that the California red-legged frog is reasonably certain to occur within the action area because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the action area, as well as the recent observations of this listed species.

California Red-Legged Frog Proposed Critical Habitat

On March 13, 2001, the final rule determining critical habitat for red-legged frogs was published in the Federal Register (U.S. Fish and Wildlife Service 2001). This rule established 31 critical habitat units based on three primary constituent elements: (a) essential aquatic habitat; (b) associated uplands; and (c) dispersal habitat connecting essential aquatic habitat. In November 2002, the U.S. District Court for the District of Columbia vacated most of the 2001 designation and ordered the Service to publish a new critical habitat proposal. On April 13, 2004, the Service re-proposed 4.1 million acres in 28 California counties as critical habitat for the frog (U.S. Fish and Wildlife Service 2004). This proposed rule basically re-proposes the same areas designated critical habitat in the 2001 final rule.

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, space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, rearing (or development) of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species (U. S. Fish and Wildlife Service 2004).

Due to the complex life history and dispersal capabilities of the California red-legged frog, and the dynamic nature of the environments in which they are found, the primary constituent elements described below are found throughout the watersheds that are proposed as critical habitat. Special management, such as habitat rehabilitation efforts (e.g., removal of nonnative predators), may be necessary in the area designated. The proposed critical habitat for the California red-legged frog provides for breeding and non-breeding habitats and for dispersal between these habitats, as well as allowing for expansion of frog populations vital to the recovery of the subspecies. The proposed critical habitat includes: (a) essential aquatic habitat; (b) associated uplands; and (c) dispersal habitat connecting essential aquatic habitat.

Aquatic habitat is essential for providing space, food, and cover, necessary to sustain all life stages of red-legged frogs. It consists of virtually all low-gradient fresh water bodies, including natural and man-made (e.g., stock) ponds, backwaters within streams and creeks, marshes, lagoons, and dune ponds, except deep lacustrine water habitat (e.g., deep lakes and reservoirs 50 acres or larger in size) inhabited by nonnative predators. The subspecies requires a permanent water source to ensure that aquatic habitat is available year-round. Permanent water sources can include, but are not limited to, ponds, perennial creeks, permanent plunge pools within intermittent creeks, seeps, and springs. Aquatic habitat used for breeding usually has a minimum deep water depth of 20 inches, and maintains water during the entire tadpole rearing season (at least March through July). During periods of drought, or less-than-average rainfall, these breeding sites may not hold water long enough for individuals to complete metamorphosis, but because they support breeding in wetter years these sites would still be considered essential breeding habitat. Ponds that support a small population of red-legged frogs, but are not surrounded by suitable upland habitat, or are cut off from other breeding ponds or permanent water sources by impassable dispersal barriers, do not have the primary constituent elements for proposed California red-legged frog critical habitat.

To be a primary constituent element for California red-legged frog proposed critical habitat, the aquatic components within the designated boundaries must include two or more breeding sites (as defined above) located within 1.25 miles of each other; at least one of the breeding sites must also be a permanent water source; or, the aquatic component can consist of two or more seasonal breeding sites with a permanent non-breeding water source located within 1.25 miles of each breeding site. California red-legged frogs have been documented to travel 2.25 miles in a virtual straight line migration from non-breeding to breeding habitats (U.S. Fish and Wildlife Service 2001a). In addition, breeding sites must be connected by dispersal habitat connecting essential aquatic habitat, described below.

Associated upland and riparian habitat is essential to maintain California red-legged frog populations associated with essential aquatic habitat. The associated uplands and riparian habitat provide food and shelter sites for California red-legged frogs, and assist in maintaining the integrity of aquatic sites by protecting them from disturbance and supporting the normal functions of the aquatic habitat. Key conditions include the timing, duration, and extent of water moving within the system, filtering capacity, and maintaining the habitat to favor red-legged frogs and discourage the colonization of nonnative species such as bullfrogs. Essential upland habitat consists of all upland areas within 300 feet, or no further than the watershed boundary, of the edge of the ordinary high-water mark of essential aquatic habitat (U.S. Fish and Wildlife Service 2001a).

Essential dispersal habitat provides connectivity among California red-legged frog breeding habitat (and associated upland) patches. While frogs can pass many obstacles, and do not require a particular type of habitat for dispersal, the habitat connecting essential breeding locations and other aquatic habitat must be free of barriers (e.g., a physical or biological feature that prevents frogs from dispersing beyond the feature) and at least 300 feet wide. Essential dispersal habitat consists of all upland and wetland habitat free of barriers that connects two or more patches of essential breeding habitat within 1.25 miles of one another. Dispersal barriers include heavily traveled roads (an average of 30 cars per hour from 10:00 p.m. to 4:00 a.m.) that possess no bridges or culverts; moderate to high density urban or industrial developments; and large reservoirs more than 50 acres in size. Agricultural lands such as row crops, orchards, vineyards, and pastures do not constitute barriers to California red-legged frog dispersal.

Dispersal habitat connecting essential aquatic habitat. Essential dispersal habitat provides connectivity among red-legged frog breeding habitat (and associated upland) patches. While frogs can pass many obstacles, and do not require a particular type of habitat for dispersal, the habitat connecting essential breeding locations and other aquatic habitat must be free of barriers (e.g., a physical or biological feature that prevents frogs from dispersing beyond the feature) and at least 300 feet wide. Essential dispersal habitat consists of all upland and wetland habitat free of barriers that connects two or more patches of essential breeding habitat within 1.25 miles of one another. Dispersal barriers include heavily traveled roads (an average of 30 cars per hour from 10:00 p.m. to 4:00 a.m.) that possess no bridges or culverts; moderate to high density urban or industrial developments; and large reservoirs more than 50 acres in size. Agricultural lands such as row crops, orchards, vineyards, and pastures do not constitute barriers to red-legged frog dispersal.

The Pigeon Pass Project occurs within the East Bay-Diablo Range unit (Unit 15), which consists of watersheds within Contra Costa, Alameda, San Joaquin, Santa Clara, Stanislaus, San Benito, Merced, and Fresno counties. The boundary of Unit 15 encompasses approximately 1.05 million acres, of which approximately 87 percent is privately owned. The remaining 13 percent is managed, in part, by various Federal, State, and local land and water management agencies. Because essential aquatic habitat, associated uplands, and essential dispersal habitat has not been widely mapped in the unit, the Service can not accurately estimate the area within the unit that supports primary constituent elements. However, due to the presence of high use roads and

developed areas as well as substantial areas without permanent water, we anticipate that the effective area of Unit 15 will be considerably less than 1.05 million acres.

Unit 15 has been affected by activities that destroy essential aquatic and upland habitats, and dispersal habitats providing connectivity between subpopulations. Degradation and loss of these habitats have occurred through urbanization, mining, inappropriate management of grazing, recreation, invasion of nonnative plants, impoundments, water diversions, degraded water quality, and introduced predators.

The action area is relatively undeveloped, and it contains State Route 84, Ruby Hills and Vineyard Estates developments, and several ranches. The surrounding habitat includes several vegetation communities, including valley oak woodland, annual non-native grassland, seasonally wetted areas with associated vegetation, and ponds. A 60-acre California red-legged frog/California tiger salamander mitigation site for the Ruby Hills/Vineyard Estates consists of a series of artificial ponds connected by drainages, and the surrounding upland habitat. As described in the Biological Assessment, essentially all undeveloped lands on and adjacent to the project site contain the constituent elements of proposed California red-legged frog critical habitat, including essential aquatic habitat, associated uplands, and essential dispersal habitat.

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp was listed as threatened on September 19, 1994 (U.S. Fish and Wildlife Service 1994). Simovich *et al.* (1992) and Ericksen and Belk (1999) provide further details about the life history and ecology of this species.

The vernal pool fairy shrimp has a delicate elongate body, large stalked compound eyes, no carapace, and 11 pairs of swimming legs. It swims or glides gracefully upside down by means of complex beating movements of the legs that pass in a wave-like anterior to posterior direction. Fairy shrimp feed on algae, bacteria, protozoa, rotifers, and bits of detritus. The females carry the eggs in an oval or elongate ventral brood sac. The eggs are either dropped to the pool bottom or remain in the brood sac until the female dies and sinks. The "resting" or "summer" eggs are capable of withstanding heat, cold, and prolonged desiccation. When the pools fill in the same or subsequent seasons, some, but not all, of the eggs may hatch. The egg bank in the soil may consist of eggs from several years of breeding (Donald 1983). The eggs hatch when the vernal pools fill with rainwater. The early stages of the vernal pool fairy shrimp develop rapidly into adults. These non-dormant populations often disappear early in the season long before the vernal pools dry up.

The vernal pool fairy shrimp inhabits vernal pools with clear to tea-colored water, most commonly in grass or mud-bottomed swales, or basalt flow depression pools in unplowed grasslands. The vernal pool fairy shrimp has been collected from early December to early May. It can mature quickly, allowing populations to persist in short-lived shallow pools (Simovich *et al.* 1992). Vernal pool fairy shrimp occupy a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools (Eng *et al.* 1990; Helm 1998; California Department of Fish and Game 2001). The pool types where the

species has been found include Northern Hardpan, Northern Claypan, Northern Volcanic Mud Flow, and Northern Basalt Flow vernal pools formed on a variety of geologic formations and soil types. Although vernal pool fairy shrimp have been collected from large vernal pools, including one exceeding 25 acres in area (Eriksen and Belk 1999), it is most frequently found in pools measuring fewer than 0.05 acre in area (Helm 1998; Gallagher 1996). The species occurs at elevations from 33 feet to 4,003 feet (Eng *et al.* 1990), and is typically found in pools with low to moderate amounts of salinity or total dissolved solids (Keeley 1984; Syrdahl 1993). Vernal pools are mostly rain fed, resulting in low nutrient levels and dramatic daily fluctuations in pH, dissolved oxygen, and carbon dioxide (Keeley and Zedler 1998). Although there are many observations of the environmental conditions where vernal pool fairy shrimp have been found, there have been no experimental studies investigating the specific habitat requirements of this species.

The hydrology that maintains the pattern of inundation and drying characteristic of vernal pool habitats is complex. Vernal pool habitats form in depressions above an impervious soil layer (duripan) or rock substrate. After winter rains begin, this impervious layer prevents the downward percolation of water and creates a perched water table causing the depression (or pool) to fill. Due to local topography and geology, the depressions are generally part of an undulating landscape, where soil mounds are interspersed with basins, swales, and drainages (Nikiforoff 1941; Holland and Jain 1978). These features form an interconnected hydrological unit known as a vernal pool complex. Although vernal pool hydrology is driven by the input of precipitation, water input to vernal pool basins also occurs from surface and subsurface flow from the swale and upland portions of the complex (Zedler 1987, Hanes *et al.* 1990, Hanes and Stromberg 1998). Surface flow through the swale portion of the complex allows vernal pool species to move directly from one vernal pool to another. Upland areas are a critical component of vernal pool hydrology because they directly influence the rate of vernal pool filling, the length of the inundation period, and the rate of vernal pool drying (Zedler 1987; Hanes and Stromberg 1998).

The vernal pool fairy shrimp has evolved unique physical adaptations to survive in vernal pools. Vernal pool environments are characterized by a short inundation phase during the winter, a drying phase during the spring, and a dry phase during the summer (Holland and Jain 1978). The timing and duration of these phases can vary significantly from year to year, and in some years vernal pools may not inundate at all. In order to take advantage of the short inundation phase, vernal pool crustaceans have evolved short reproduction times and high reproductive rates. The listed crustaceans generally hatch within a few days after their habitats fill with water, and can start reproducing within a few weeks (Eng *et al.* 1990; Helm 1998; Eriksen and Belk 1999). Vernal pool crustaceans can complete their entire life cycle in a single season, and some species may complete several life cycles. Vernal pool crustaceans can also produce numerous offspring when environmental conditions are favorable. Some species may produce thousands of cysts during their life spans.

To survive the prolonged heat and desiccation of the vernal pool dry phase, vernal pool crustaceans have developed a dormant stage. After vernal pool crustacean eggs are fertilized in the female's brood sac, the embryos develop a thick, usually multi-layered shell. When embryonic development reaches a late stage, further maturation stops, metabolism is drastically

slowed, and the egg, now referred to as a cyst, enters a dormant state called diapause. The cyst is then either dropped to the pool bottom or remains in the brood sac until the female dies and sinks. Once the cyst is desiccated, it can withstand temperatures near boiling (Carlisle 1968), fire (Wells *et al.* 1997), freezing, and anoxic conditions without damage to the embryo. The cyst wall cannot be affected by digestive enzymes, and can be transported in the digestive tracts of animals without harm (Horne 1967). Most fairy shrimp cysts can remain viable in the soil for a decade or longer (Belk 1998).

Although the exact signals that cause crustacean cysts to hatch are unknown, factors such as soil moisture, temperature, light, oxygen, and osmotic pressure may trigger the embryo's emergence from the cyst (Brendonck 1996). Because the cyst contains a well developed embryo, the animal can quickly develop into a fully mature adult. This allows vernal pool crustaceans to reproduce before the vernal pool enters the dry phase, sometimes within only a few weeks (Helm 1998, Eriksen and Belk 1999). In some species, cysts may hatch immediately without going through a dormant stage, if they are deposited while the vernal pool still contains water. These cysts are referred to as quiescent, and allow the vernal pool crustacean to produce multiple generations in a single wet season as long as their habitat remains inundated.

Another important adaptation of vernal pool crustaceans to the unpredictable conditions of vernal pools is the fact that not all of the dormant cysts hatch in every season. Hathaway and Simovich (1996) found that only 6 percent of endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*) cysts hatched after initial hydration, and only 0.18 percent of Riverside fairy shrimp cysts hatched. The cysts that don't hatch remain dormant and viable in the soil. These cysts may hatch in a subsequent year, and form a cyst bank much like the seed bank of annual plants. The cyst bank may be comprised of cysts from several years of breeding, and large cyst banks of viable resting eggs in the soil of vernal pools containing fairy shrimp have been well documented (Belk 1998). Based on a review of other studies (e.g. Belk 1977; Gallagher 1996, Brendonck 1996), Hathaway and Simovich (1996) concluded that species inhabiting more unpredictable environments, such as smaller or shorter lived pools, are more likely to have a smaller percent of their cysts hatch after their vernal pool habitats fill with water. This strategy reduces the probability of complete reproductive failure if a vernal pool dries up prematurely. This kind of "bet-hedging strategy" has been suggested as a mechanism by which rare species may persist in unpredictable environments (Chesson and Huntly 1989; Ellner and Hairston 1994).

Upland areas associated with vernal pools are also an important source of nutrients to vernal pool organisms (Wetzel 1975). Vernal pool habitats derive most of their nutrients from detritus which is washed into the pool from adjacent uplands, and these nutrients provide the foundation for vernal pool aquatic communities food chain. Detritus is a primary food source for the vernal pool crustaceans (Eriksen and Belk 1999).

Vernal pool fairy shrimp generally will not hatch until water temperatures drop to below 50°F (Gallagher 1996; Helm 1998). This species is capable of hatching multiple times within a single wet season if conditions are appropriate. Helm (1998) observed 6 separate hatches of vernal pool

fairy shrimp within a single wet season, and Gallagher (1996) observed 3 separate hatches in vernal pools in Butte County.

Helm (1998) observed vernal pool fairy shrimp living for as long as 147 days. The species can reproduce in as few as 18 days at optimal conditions of 68°F and can complete its life cycle in as little as 9 weeks (Gallagher 1996; Helm 1998). However, maturation and reproduction rates of vernal pool crustaceans are controlled by water temperature and can vary greatly (Eriksen and Brown 1980; Helm 1998). Helm (1998) observed that vernal pool fairy shrimp did not reach maturity until 41 days at water temperatures of 59°F. Vernal pool fairy shrimp has been collected at water temperatures as low as 40°F (Eriksen and Belk 1999), however, the species has not been found in water temperatures above about 73°F (Helm 1998; Eriksen and Belk 1999).

The vernal pool fairy shrimp is known from 32 populations extending from Stillwater Plain in Shasta County through most of the length of the Central Valley to Pixley in Tulare County, and along the central coast range from northern Solano County to Pinnacles in San Benito County (Eng et al. 1990; Fugate 1992; Sugnet and Associates 1993) and a disjunct population on the Agate Desert in Oregon. Five additional, disjunct populations exist: one near Soda Lake in San Luis Obispo County; one in the mountain grasslands of northern Santa Barbara County; one on the Santa Rosa Plateau in Riverside County, one near Rancho California in Riverside County and one on the Agate Desert near Medford, Oregon. Three of these isolated populations each contain only a single pool known to be occupied by the vernal pool fairy shrimp. The genetic characteristics of these species, as well as ecological conditions, such as watershed continuity, indicate that populations of these animals are defined by pool complexes rather than by individual vernal pools (Fugate 1992). Therefore, the most accurate indication of the distribution and abundance of these species is the number of inhabited vernal pool complexes. Individual vernal pools occupied by these species are most appropriately referred to as subpopulations.

The primary historic dispersal method for the vernal pool fairy shrimp likely was large scale flooding resulting from winter and spring rains which allowed the animals to colonize different individual vernal pools and other vernal pool complexes. This dispersal currently is non-functional due to the construction of dams, levees, and other flood control measures, and widespread urbanization within significant portions of the range of this species. Waterfowl and shorebirds likely are now the primary dispersal agents for vernal pool tadpole shrimp and vernal pool fairy shrimp (Brusca in litt.; 1992, King in litt., 1992; Simovich in litt., 1992). The eggs of these crustaceans are either ingested (Krapu 1974; Swanson *et al.* 1974; Driver 1981; Ahl 1991) and/or adhere to the legs and feathers where they are transported to new habitats.

Vernal pool crustaceans are often dispersed from one pool to another through surface swales that connect one vernal pool to another. These dispersal events allow for genetic exchange between pools and create a population of animals that extends beyond the boundaries of a single pool. Instead, populations of vernal pool crustaceans are defined by the entire vernal pool complex in which they occur (Simovich *et al.* 1992, King 1996). These dispersal events also allow vernal pool crustaceans to move into pools with a range of sizes and depths. In dry years, animals may only emerge in the largest and deepest pools. In wet years, animals may be present in all pools,

or in only the smallest pools. The movement of vernal pool crustaceans into vernal pools of different sizes and depths allows these species to survive the environmental variability that is characteristic of their habitats.

Vernal pool crustaceans are an important food source for a number of aquatic and terrestrial species. Aquatic predators include insects such as backswimmers (Woodward and Kiesecker 1994), predaceous diving beetles and their larvae, and dragonflies and damselfly larvae. Vernal pool tadpole shrimp are another significant predator of fairy shrimp. Vernal pools provide important habitat for resident and migratory birds, particularly waterfowl and shorebirds. Birds are particularly attracted to the pools because they offer foraging habitat at a time of year when resources are limited (Silveira 1998), and vernal pools help link aquatic resources in the California portion of the Pacific Flyway. Vernal pool crustaceans provide important proteins and calcium vital to the energetic needs of migratory bird migration and reproduction (Proctor *et al.* 1967; Silveira 1998). Vernal pool crustaceans are a major food source for a number of terrestrial vertebrate predators including water fowl, wading birds, toads, frogs, and salamanders (Proctor *et al.* 1967; Krapu 1974; Swanson 1974; Morin 1987; Simovich *et al.* 1991; Silveira 1998). Vernal pool crustaceans depend on the absence of water during the summer months to discourage aquatic predator species such as bullfrogs, garter snakes, and fish (Eriksen and Belk 1999).

The vernal pool fairy shrimp is imperiled by a variety of human-caused activities, primarily urban development, water supply/flood control projects, and land conversion for agricultural use. Habitat loss occurs from direct destruction and modification of pools due to filling, grading, discing, leveling, and other activities, as well as modification of surrounding uplands which alters vernal pool watersheds. Other activities which adversely affect these species include off-road vehicle use, certain mosquito abatement measures, and pesticide/herbicide use. The main threat to listed vernal pool crustaceans is the loss of habitat associated with human activities, including urban/suburban development, water supply/flood control development, and conversion of natural lands to intensively farmed agricultural uses. According to the 1997 National Resources Inventory, released by the Natural Resources Conservation Service (1999), California ranked sixth in the nation in number of acres of private land developed between 1992 and 1997, at nearly 695,000 acres. Habitat loss occurs from direct destruction and modification of pools due to filling, grading, discing, leveling, and other activities, as well as modification of surrounding uplands which alters vernal pool watersheds. Other activities which adversely affect these species include off-road vehicle use, certain mosquito abatement measures, and pesticide/herbicide use, alterations of vernal pool hydrology, fertilizer and pesticide contamination, activity, invasions of aggressive non-native plants, gravel mining, and contaminated stormwater runoff. State and local laws and regulations do not protect listed vernal pool crustaceans, while other laws and regulations, including the Clean Water Act, have not effectively maintained habitat necessary to conserve and recover these species. Although developmental pressures continue, only a small fraction of vernal pool habitat is protected from the threat of destruction.

Holland (1978) estimated that between 67 and 88 percent of the area within the Central Valley of California which once supported vernal pools had been destroyed by 1973. However, an analysis of this report by the Service revealed apparent arithmetic errors which resulted in a determination

that a historic loss between 60 and 85 percent may be more accurate. Regardless, in the ensuing years, threats to this habitat type have continued and resulted in a substantial amount of vernal pool habitat being converted for human uses in spite of Federal regulations implemented to protect wetlands. For example, the Corps' Sacramento District has authorized the filling of 467 acres of wetlands between 1987 and 1992 pursuant to Nationwide Permit 26 (U.S. Fish and Wildlife Service 1992). The Service estimates that a majority of these wetland losses within the Central Valley involved vernal pools, the habitat of the vernal pool tadpole shrimp and vernal pool fairy shrimp. Current rapid urbanization and agricultural conversion throughout the ranges of these two species continue to pose the most severe threats to the continued existence of the vernal pool tadpole shrimp and vernal pool fairy shrimp. The Corps' Sacramento District has several thousand vernal pools under its jurisdiction (Coe 1988), which includes most of the known populations of these listed species. It is estimated that within 20 years 60 to 70 percent of these pools will be destroyed by human activities (Coe 1988).

In addition to direct habitat loss, the vernal pool habitat for the vernal pool tadpole shrimp and vernal pool fairy shrimp has been and continues to be highly fragmented throughout their ranges due to conversion of natural habitat for urban and agricultural uses. This fragmentation results in small isolated vernal pool tadpole shrimp and vernal pool fairy shrimp populations. Ecological theory predicts that such populations will be highly susceptible to extirpation due to chance events, inbreeding depression, or additional environmental disturbance (Gilpin and Soule 1986; Goodman 1987a, 1987b). If an extirpation event occurs in a population that has been fragmented, the opportunities for recolonization would be greatly reduced due to physical (geographical) isolation from other (source) populations.

In addition to direct habitat loss, the vernal pool habitat for this listed vernal pool crustacean is also highly fragmented throughout their ranges due to the nature of vernal pool landscapes and the conversion of natural habitat by human activities. Such fragmentation results in small, isolated populations of listed crustaceans which may be more susceptible to extinction due to random demographic, genetic, and environmental events. Should an extirpation event occur in a population that has been fragmented, the opportunities for recolonization would be greatly reduced due to physical (geographical) isolation from other (source) populations.

Vernal pools and ephemeral wetlands are found at seven sites in the action area of the Pigeon Pass Project (California Department of Transportation 2004). Service-approved protocols for sampling for the listed crustacean were not followed at the proposed project. Two of the seven sites were not sampled for vernal pool crustaceans because they were located more than 250 feet from the construction area. Back-to-back dry and wet season surveys were conducted at the remaining five sites (California Department of Transportation 2004). Cysts of fairy shrimp of the genus *Branchinecta* were found at one of the pools; however, the specific identity was not determined. This vernal pool is in the right-of-way and cut-and-fill limits for the Pigeon Pass Project, and will be partially filled as a result of the proposed action. Surveys were discontinued at one of the sites when California red-legged frog egg masses were discovered, however, that site is over 250 feet from the zone of disturbance. The vernal pool fairy shrimp has been recorded within 7 miles of the proposed project (California Department of Fish and Game 2004) and suitable habitat for this listed animal is found in the action area of the project. Therefore, the

Service has determined it is reasonable to conclude the vernal pool fairy shrimp occurs in the action area because of the biology and ecology of the species, the presence of suitable habitat, as well as the nearby observations of this listed crustacean.

Effects of the Proposed Action

The proposed Pigeon Pass Project likely will result in a number of adverse effects to the San Joaquin kit fox, California tiger salamander, California red-legged frog, and the vernal pool fairy shrimp. There is a likelihood the animals may be affected by being crushed, entombed in their burrows, their cysts buried or crushed, hit and injured or killed by vehicle strikes, being shot, chased and injured or killed by domestic pet dogs, poisoned by chemical agents, trapped in erosion control netting, or harassed by noise and vibration. The San Joaquin kit fox, California red-legged frog, and California tiger salamander may be adversely affected by the proposed project blocking travel corridors, or by evening construction disturbing night time foraging, mating, movement, or subjecting them to predation that otherwise would not occur. These four listed animals inhabit the project site and surrounding vicinity (for purposes of this biological opinion the surrounding vicinity is described as 1000 feet outside and adjacent to the project footprint) are likely to be subject to indirect effects including loss of habitat, pesticide or chemical poisoning, exotic predators, competitors, and non-native plants, disease, and a reduction in natural food sources as a result of habitat disturbance and loss.

Temporary effects are project activities that temporarily remove one or more essential components of the habitat of a listed species, but can be restored to pre-project conditions of equal or greater habitat value. In order for the effects to be considered temporary, the affected habitat of the listed species must be totally restored within two seasons. Ground disturbance resulting from the proposed Pigeon Pass Project includes substantial grading, excavating, and fill. The California Department of Transportation is considering the adverse effects of a significant amount of cut and fill of earth, a maximum of approximately 68 acres, to be of a temporary nature. This cut and fill has potential to cause injury and mortality to individual San Joaquin kit foxes, California tiger salamanders, and the California red-legged frogs occupying the action area, and these areas likely will not be suitable for use as habitat for foraging, breeding, resting and other essential behaviors by these three animals for a significant period of time, almost certainly longer than two seasons after the construction of the project is completed. As part of the project description, the California Department of Transportation has stated upon completion of the project, they will re-contoured temporally affected habitat areas if necessary, and revegetate them to promote restoration of the area to pre-project conditions. The temporary effects will result in the permanent loss of the habitat utilized by these three listed animal species unless the restoration implemented the California Department of Transportation is adequately planned, utilizes native California plant species collected in the immediate area of the proposed project, and meets specific success criteria.

The proposed Pigeon Pass Project includes two oversized culverts that that will allow adjacent landowners to access their properties, and also twelve drainage culverts. The California Department of Transportation has stated these undercrossing and culverts will function as wildlife movement corridors but adequate information was not made available to the Service on

such factors as the sizes or other data that would have allowed an adequate evaluation of the effectiveness of this proposed conservation measure.

Construction equipment that has been used in different areas and with different species of amphibians including the California tiger salamander and the California red-legged frog may transmit diseases by introducing contaminated soil and other material on the 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 amphibians or increase the sensitivity of the amphibian to environmental changes (e.g., water pH) that reduce normal immune response capabilities (Bosch *et al.* 2000).

This conference opinion on the proposed critical habitats for the California tiger salamander and the California red-legged frog does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR § 402.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete the following analysis with respect to the proposed critical habitats.

San Joaquin Kit Fox

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species

Construction related activities are likely to cause disruption of foraging, disruption or complete loss of reproduction, harassment from increased human activity, and permanent and temporary loss of shelter. Because these animals are nocturnal, when construction is performed at night, associated lighting likely would increase all of the above effects. Lighting associated with night construction will also increase the likelihood of predation on San Joaquin kit foxes by removing the cover of darkness. The animals that avoid construction activities may become displaced into adjacent areas. Nocturnally active mammalian predators may be vulnerable to increased predation, exposure, starvation, or stress through disorientation, loss of shelter, and intraspecific and interspecific aggression (Grigione 2002).

Range-wide habitat loss, fragmentation, and degradation from multiple factors is the primary threat to the San Joaquin kit fox (U.S. Fish and Wildlife Service 1998). Approximately 95% of native habitat for kit fox habitat in the San Joaquin Valley has been destroyed by agricultural, industrial, and urban development (U.S. Fish and Wildlife Service 1998). Loss of natural lands continues to occur further reducing the habitat available for the animal. The amount of historical

and current habitat loss directly attributable to road has not been calculated. Estimates of the area occupied by roads under the jurisdiction of California Department of Transportation includes 591 acres for Kings County, 431 hectares (1065 acres) for Merced County, 2019 acres for Fresno County, and 3669 acres for Kern County (Cypher 2000). These estimates are based on a standard lane width of 11.8 feet, and not all of this area is in kit fox habitat. However, the estimates do not include road shoulders, medians, or associated developments (e.g. Interchanges, signs), and also do not include the area occupied by county and city roads.

The effect of habitat fragmentation on the San Joaquin kit fox is potentially significant and likely will: (1) reduce access to habitat as well as habitat suitability, and (2) disrupt movement, dispersal, and gene flow. The construction of roads through San Joaquin kit fox habitat may restrict or block access to adjacent and formerly contiguous habitat patches. The likelihood of this effect increases with larger road size, higher traffic volume, and the presence of fences or median barriers. Knapp (1978) monitored movements of radio-collared San Joaquin kit foxes in the vicinity of Interstate 5 in Kern County. Many of the foxes used areas within 2 miles of the highway, and most exhibited movement and home range patterns that parallel the highway, but did not cross it. Only on 2 occasions were animals located on the opposite side of the highway from their primary area of use. Interstate 5 has an effect on kit fox use patterns and restricts movements by the San Joaquin kit fox between habitat blocks.

In addition to limiting access to habitat patches, roads also may reduce the suitability of habitat for San Joaquin kit foxes by fragmentation into patches too small for effective use by the animals. As a habitat patch decreases in size, the number of San Joaquin kit foxes the patch can support also decreases. This increases the probability that the animals will be extirpated from each patch. The possibility for recolonization will depend upon the nature of the factors, e.g., roads, canals, development, etc., that are causing the fragmentation. Estimates of home range size for the San Joaquin kit fox vary from 1.7 square miles to 4.5 square miles (White and Ralls 1993). Typically, a mated pair will share a home range. If a habitat fragment is too small to support a home range, it may be abandoned by the animals. Whether or not the patch can be used as part of a San Joaquin kit fox home range will depend upon the nature of the factors causing the fragmentation.

Fragmentation factors that effectively isolate patches and limit access also constitute barriers to San Joaquin kit fox movements, dispersal, and gene flow. Movements and dispersal corridors are critical to kit fox population dynamics, particularly because the animals currently persist as metapopulations with multiple disjunct population centers. Movement and dispersal corridors are important for alleviating over-crowding and intraspecific competition during years when San Joaquin kit fox abundance is high, and also they are important for facilitating the recolonization of areas where the animal has been extirpated. Movement between population centers maintains gene flow and reduced genetic isolation. Genetically isolated populations are at greater risk of deleterious genetic effects such as inbreeding, genetic drift, and founder effects.

Roads have been documented as barriers to movements by a diversity of species, and this effect varies with road size and traffic volume. Bobcats (*Felis rufus*) in Wisconsin readily crossed dirt roads, but were reluctant to cross paved roads (Lovallo and Anderson 1996). Lynx also exhibit a

reluctance to cross roads (Barnum 1999) as do mountain lions (*Felis concolor*) (Van Dyke *et al.* 1986). In a study in North Carolina, the number of road crossings by black bears (*Ursus americanus*) was inversely related to traffic volume, and bears almost never crossed an interstate highway (Brody and Pelton 1989). Endangered Sonoran pronghorn (*Antilocarpa americana*) in Mexico are reluctant to cross a 2-lane highway, and the planned expansion of the road could further restrict movements (Castillo-Sanchez 1999). Many rodents are reluctant to cross roads (Oxley *et al.* 1974).

The inhibition of animal movements caused by roads produces a significant effect by fragmenting habitats and populations (Joly and Morand 1997). Roads were found to be significant barriers to gene flow among common frogs (*Rana temporaria*) in Germany and this has resulted in genetic differentiation among populations separated by roads (Reh and Seitz 1990). Similarly, significant genetic subdivision was detected in bank voles (*Clethrionomys glareolus*) populations separated by a 50-meter (164 foot) wide highway in Germany (Gerlach and Musolf 2000). In California, local extirpations of mountain lions has occurred when roads and other developments fragmented habitat in small patches and blocked movement corridors thereby isolating the patches and preventing recolonization (Beier 1993). Adequately sized culverts or undercrossings with suitable habitat at each side of the passage significantly increases the ability of mammals to cross highways (Ng *et al.* 2003).

San Joaquin kit fox mortality and injury occurs when the animals attempt to cross roads and are hit by cars, trucks, or motorcycles. The majority of strikes likely occur at night when the animals are most active. Driver visibility also is lower at night increasing the potential for strikes. Such strikes are usually fatal for an animal the size of a San Joaquin kit fox. Thus, vehicle strikes are a direct source of mortality for this listed canine. If vehicle strikes are sufficiently frequent in a given locality, they could result in reduced San Joaquin kit fox abundance. The death of animals during the November-January breeding season could result in reduced reproductive success. Death of females during gestation or prior to pup weaning could result in the loss of an entire litter of young, and therefore, reduced recruitment of new individuals into the population.

Occurrences of vehicle strikes involving San Joaquin kit foxes have been well documented, and such strikes occur throughout the range of the species. Sources of kit fox mortality were examined during 1980-1995 at the Naval Petroleum Reserve in California in western Kern County (Cypher *et al.* 2000). During this period, 341 adult San Joaquin kit foxes were monitored using radio telemetry, and 225 of these animals were recovered dead. Of these, 20 were struck by vehicles; 9% of adult kit mortalities were attributed to vehicles, and 6% of all monitored adults were killed by vehicles. During this same period, 184 juvenile (<1 year old) kit foxes were monitored. Of these, 142 were recovered dead and 11 were killed by vehicles; 8% of juvenile kit fox mortalities were attributed to vehicles and 6% of all monitored juveniles were killed by vehicles. For both adults and juveniles, vehicle strikes accounted for less than 10% of all San Joaquin kit fox deaths in most years. However, in some years, vehicles accounted for about 20% of deaths. Predators, primarily coyotes and bobcats, were the primary source of mortality at the Naval Petroleum Reserves. In addition, 70 kit foxes, both radio collared and non-collared, were found dead on roads in and around the Naval Petroleum Reserve during 1980-1991 (U.S. Department of Energy 1993). Of these, 34 were hit by vehicles on the approximately

1,600 kilometers (990 miles) of roads at the Reserve, and 36 were struck on the approximately 80 kilometers (50 miles) of State and County roads (e.g., State Route 119, Elk Hills Road), where traffic volumes and average vehicle speeds were higher.

In other areas of western Kern County, 49 kit foxes were radio-collared in the highly developed Midway-Sunset oil field, and 54 kit foxes were radio-collared in the Lokern Natural Area, a nearby undeveloped area, during 1989-1993 (Spiegel and Disney 1996). Of these animals, 60 were recovered dead; 1 (2%) was killed by a vehicle, and it was found in an undeveloped area along the access road adjacent to the California aqueduct. However, 6 non-collared kit foxes were killed by vehicles on the access road. Predators, primarily coyotes, bobcats, and feral dogs were responsible for most deaths in this study. Forty-one San Joaquin kit foxes were radio-collared and monitored during 1989-1991 on the Carrizo Plain Natural Area in eastern San Luis Obispo County (Ralls and White 1995). Twenty-two were found dead; 1 (5%) were attributed to a vehicle strike. At the Camp Roberts National Guard Training Facility in Monterey and San Luis Obispo counties, 94 San Joaquin kit foxes were radio-collared during 1988-1992 (Standley *et al.* 1992). Forty-nine were found dead and 2 were attributed to vehicle strikes; 4% of the deaths were caused by vehicles and 2% of all monitored kit foxes were killed by vehicles. In western Merced County, 28 San Joaquin kit foxes were radio-collared during 1985-1987 (Briden *et al.* 1992). Seventeen were found dead and 2 (12%) of these deaths were attributed to vehicles. In the City of Bakersfield, 113 San Joaquin kit foxes were radio-collared and monitored during 1997-2000 (Cypher 2000). Thirty-five were recovered dead (123 adults and 12 pups); 9 adults (39%) and 6 pups (50%) were attributed to vehicle strikes. At this urban site, coyotes and bobcats are rare, and vehicles are the primary source of kit fox mortality. However, survival rates are higher than rates among kit foxes in non-urban areas, and vehicles do not appear to be limiting the population size.

Vehicles constitute a consistent source of mortality for the animal, based on the frequency with which vehicle strikes occur. However, the precise effect of vehicle strikes on the San Joaquin kit fox has not been adequately investigated. According to Morrell (1970), "The automobile is by far the major cause of reported San Joaquin kit fox deaths - 128 of 152 deaths reported were caused by automobiles." Morrell acknowledged that the numbers were based on non-radio-collared kit foxes and therefore were biased because road-killed foxes are conspicuous and easily observed compared to animals dying from other causes. Predators such as coyotes, bobcats, non-native red foxes, and domestic dogs likely constitute a higher source of mortality than vehicle strikes (U.S. Fish and Wildlife Service 1998; Cypher 2000).

The local and range-wide effects of vehicle strikes on San Joaquin kit foxes have not been adequately assessed. Vehicle strikes appear to occur most frequently where roads transverse areas where the animals are abundant. However, the linear quantity of roads in a given area may not be directly related to the number of vehicle strikes in a given area, as exemplified by the situation at the Naval Petroleum Reserve. The type of road (e.g., number of lanes) traffic volume, and average speed of vehicles likely all influence the number of San Joaquin kit fox/vehicle strikes. The number of strikes likely increases with road size, traffic volume, and average speed (Clevenger and Waltho 1999). Another factor influencing the number of vehicles striking this endangered mammal, but for which little data is available, is the frequency with

which the animals cross roads and are therefore at risk. The proportion of successful road crossings by these animals likely declines with increasing road size, traffic volume and density, and vehicle speeds. The proportion of San Joaquin kit foxes successfully crossing roads may increase in areas where they obtain more experience crossing roads, such as in and near urban areas.

Based on a study of another kit fox subspecies, Egoscue (1962) reported that 8 tagged foxes (*Vulpes macrotis nevadensis*) in Utah were killed by vehicles, and 5 of these were pups. Pups appeared to be more vulnerable to vehicle strikes. Many of the foxes killed were residents that were using dens located near roads. O'Neal *et al* (1987) examined 23 dead kit foxes in western Utah in 1983. None were killed by vehicles, possibly due to the remoteness of the study site.

Swift foxes (*Vulpes velox*) are closely related to the San Joaquin kit fox, and are listed as an endangered in Canada. They show numerous ecological similarities with the San Joaquin kit fox. Hines (1980) reported that roads were a major source of swift fox mortality in Nebraska. In Alberta, where the swift fox was extirpated and recently reintroduced, vehicles were responsible for 5 of 89 (6%) of the foxes found dead (Cabyn *et al* 1994). Pups appeared to be especially vulnerable, particularly if the natal dens were located near roads (Cabyn 1998). In western Kansas, 41 adults and 24 juvenile swift foxes were radio collared and monitored during 1996-97 on 2 study sites (Sovada *et al* 1998). Among the adults, 18 were found dead, but none were killed by vehicles. Among the juveniles, 14 were found dead and 4 (29%) of these had been struck by vehicles. All 7 of the juveniles killed by vehicles were found on the same study site. This study site had 90% more roads compared to the other study site where no foxes were killed by vehicles (78 miles vs. 41 miles). At a remote site in Colorado with few roads and restricted public access, swift foxes were rarely struck by vehicles (Covell 1992; Kitchen *et al.* 1999).

Vehicle-related mortality has significantly affected other listed or rare species. Vehicles caused 49% of the mortality documented among endangered Florida panthers (*Felis concolor coryi*) (Maehr *et al.* 1991). With a small remaining population, the loss of any individuals to vehicles could constitute a significant population effect. Similarly, at least 15% of the remaining 250-300 key deer (*Odocoileus virginianus clavium*) are killed annually by vehicles (Tubak 1999), and this mortality is considered to be a limiting factor for this endangered species (U.S. Fish and Wildlife Service 1985). Mortality from vehicles was the primary source of mortality for endangered ocelots (*Felis pardalis*) in Texas (Tubak 1999), and also contributed to the failure of a lynx (*Lynx lynx*) reintroduction project in New York (Aubrey *et al.* 1999). Rudolph *et al.* (1999) estimated that road-associated mortality may have depressed populations of Louisiana pine snakes (*Pituophis ruthveni*) and timber rattlesnakes (*Crotalus horridus*) by over 50% in eastern Texas, and this mortality may be a primary factor in local extirpations of timber rattlesnakes (Rudolph *et al.* 1998). Mortality from vehicles also is contributing to the reduction in the status of the prairie garter snake (*Thamnophis radix radix*) in Ohio (Dalrymple and Reichenbach 1984), and was a limiting factor in the recovery of the endangered American crocodile (*Crocodylus acutus*) in Florida (Kushland 1998). In Florida, threatened Florida scrub-jays (*Aphelocoma coerulescens*) suffered higher mortality in territories near roads, as well as reduced productivity due to vehicle strikes of both breeding adults and young (Mumme *et al.* 1999).

Construction, maintenance, and operational activities associated with roads may result in a disturbance effect on nearby San Joaquin kit foxes. Disturbance can result from noise, vibration, odors, or human activity. Disturbance may affect the kit foxes by interfering with sensory perception which could interfere with their ability to locate prey, pups, or mates, or detect approaching predators. Disturbance could induce stress which may affect physiological parameters or behavior. The resulting effects could include increase energetic requirements, decrease reproductive output, decrease immunological functions, altered space use patterns, displacement, or possibly death. Observations from a variety of sources and situations suggest that San Joaquin kit foxes may not be significantly affected by disturbance, even when the source is prolonged or continuous (Cypher 2000). However, individual animals may be more affected than others, and it is unknown whether disturbance may result in reduced local abundance.

An increase in the ambient noise level is not, in itself, likely to cause direct harm to kit foxes. No specific research has been performed on this species but a "safe, short-term level" for humans has been determined to be 75 decibels (dBA) (NIH 1990; Burglund and Lindvall 1995). The mechanisms leading to permanent hearing damage are the same for all mammals (NIH 1990). However, the enlarged pinna and reduced tragi of kit foxes indicate that hearing is more acute than in humans (Jameson and Peeters 1988). Hearing loss in humans has been correlated with cognitive dysfunction (NIH 1990). However, variation in response to intense noise has been found to vary, in humans, by as much as 30 to 50 dBA between individuals (NIH 1990). Similar variation has been found in animal studies as well (NIH 1990). Hearing loss was greater in male than in female humans; however, this may be caused by environmental factors (NIH 1990). Also, younger animals have been shown to be more susceptible to noise-induced hearing loss (NIH 1990). The ability to habituate to noise appears to vary widely between species (NPS 1990). Typical construction machinery produces noise in the range of 75 dBA (arc-welder) to 85 dBA (bulldozer) (Burglund and Lindvall 1995). Long-term noise levels of 85 dBA are recognized to cause permanent hearing damage in humans (NIH 1990). Noise at the 85 dBA level has been correlated with hypertension in Rhesus monkeys (*Macaca fascicularis*) (Comman 2001). Increased reproductive failure in laboratory mice (*Mus musculus*) was found to occur after a level of 82-85 dBA for one week (Comman 2001). However, measurable loss of hearing was found to occur in chinchillas (*Chinchilla laniger*) at a sustained level of 70 dBA (Peters 1965). Hearing loss from motorcycle traffic has been documented for the kangaroo rat (*Dipodomys* species) (Bondello and Brattstrom 1979) and desert kangaroo rats (*Dipodomys deserti*) showed a significant reduction in reaction distance to the sidewinder (*Crotalus cerastes*) after exposure to 95 dBA (Comman 2001). Other desert mammals appear to sustain the same impacts from noise (Bondello and Brattstrom 1979). Aircraft noise has produced accelerated heart-rates in pronghorn (*Antilocapra americana*), bighorn sheep (*Ovis canadensis*), and elk (*Cervus elaphus*) (MacArthur 1976; Workman *et al.* 1992 both cited in U.S. National Park Service 1994).

Hearing loss is correlated with distance from the source of the noise. At a level of 110 dBA, guinea pigs (*Cavia porcellus*) suffered long-term hearing loss at distances of 75 and 150 feet, temporary loss at a distance of 100 meters, and no measurable loss at 4500 feet (Gonzales *et al.* 1970). Over water, noise is reduced at a rate of 5 dBA for each doubling of the distance to the

source (Komanoff & Shaw 2000). For instance, a noise that measured 20 dBA at 60 feet registers 10 dBA at 40 meters.

Harassment from long-term noise may cause San Joaquin kit foxes to eventually vacate the project site and adjacent areas. Endangered California condors (*Gymnogyps californianus*) have been shown to abandon nesting sites in response to vehicle noise (Shaw 1970). Grizzly bears (*Ursus arctos*), mountain goats (*Oreamnos canadensis*), caribou (*Rangifer* species), and bighorn sheep (*Ovis* spp.) have all been found to abandon foraging or calving areas in response to aircraft noise (Chadwick 1973; McCourt *et al.* 1974; Ballard 1975; Krausman and Hervert 1983; Gunn *et al.* 1985; Bleich 1990; all cited in U.S. National Park Service 1994).

Project effects on San Joaquin kit foxes are expected to be greater during the den selection, pregnancy, and early pup dependency periods of the breeding cycle (December through July) than at other times of the year. San Joaquin kit foxes may exhibit increased sensitivity to disturbance during this period and therefore, ideally, surface-disturbing activities should occur between August and November. Habitat compensation measures are anticipated to minimize habitat effects that result from implementation of the project.

The presence of roads in an area could result in the introduction of chemical contaminants to the site. Contaminants could be introduced in several ways. Substances used in road building materials or to recondition roads can leach out or wash off roads adjacent habitat. Vehicle exhaust emissions can include hazardous substances which may concentrate in soils along roads. Heavy metals such as lead, aluminum, iron, cadmium, copper, manganese, titanium, nickel, zinc, and boron are all emitted in vehicle exhaust (Trombulak and Frissell 2000). Concentrations of organic pollutants (e.. Dioxins, polychlorinated biphenyls) are higher in soils along roads (Benfenati *et al.* 1992). Ozone levels are higher in the air near roads (Trombulak and Frissell 2000). Vehicles may leak hazardous substances such as motor oil and antifreeze. Although the quantity leaked by a given vehicle may be minute, these substances can accumulate on roads and then get washed into the adjacent environment by runoff during rain storms. An immense variety of substances could be introduced during accidental spills of materials. Such spills can result from small containers falling off passing vehicles, or from accidents resulting in whole loads being spilled. Large spills may be partially or completely mitigated by clean-up efforts, depending on the substance.

San Joaquin kit foxes using areas adjacent to roads could be exposed to any contaminants that are present at the site. Exposure pathways could include inhalation, dermal contact, direct ingestion, ingestion of contaminated soil or plants, or consumption of contaminated prey. Exposure to contaminants could cause short- or long-term morbidity, possibly resulting in reduced productivity or mortality. Carcinogenic substances could cause genetic damage resulting in sterility, reduced productivity, or reduced fitness among progeny. Contaminants also may have the same effect on kit fox prey species. This could result in reduced prey abundance and diminished local carrying capacity for the kit fox.

Little information is available on the effects of contaminants on the San Joaquin kit fox. The effects may be difficult to detect. Morbidity or mortality likely would occur after the animals had

left the contaminated site, and more subtle effects such as genetic damage could only be detected through intensive study and monitoring. However, effects have been detected on some occasions. At the Naval Petroleum Reserve, 3 kit foxes are known to have been killed by drowning in spills of crude oil (Cypher *et al.* 2000). Spiegel and Disney (1996) reported that a kit fox was found covered with crude oil at the Midway-Sunset oil field, and this individual died despite treatment. Other animals, some of which were prey species for the kit fox, were found drowned in crude oil at the Naval Petroleum Reserve (U.S. Department of Energy 1993). Such spills potentially can cause local reductions in the abundance of kit foxes and their prey. Construction of roads can facilitate the invasion and establishment by species not native to the area. Disturbance and alteration of habitat adjacent to roads may create favorable conditions for non-native plants and animals. These exotic species can spread along roadsides and then into adjacent habitat. Non-native animals may use modified habitats adjacent to road to disperse into kit fox habitat. They could compete with kit foxes for resources such as food or dens, or directly injure or kill San Joaquin kit foxes. Non-native plants and animals may reduce habitat quality for the listed canine or their prey, and reduce the productivity or the local carrying capacity for the endangered species. Introductions of non-native species could cause San Joaquin kit foxes to alter behavioral patterns by avoiding or abandoning areas near road (Cypher 2000).

Disturbed areas adjacent to roads provide favorable habitat conditions for a number of non-native plant species. Some of these taxa are aggressively invasive and they can alter natural communities and potentially affect habitat quality. A problematic species within the range of the San Joaquin kit fox is yellow star thistle (*Centaurea melitensis*). Dense stands of this plant can form along roadsides and then spread into adjacent habitat. This plant displaces native vegetation, compete with native plants for resources, does not appear to be used by San Joaquin kit fox prey, dense growth, and may be difficult for the listed canine to move through due its large size (up to 3.3 feet tall), and numerous sharp spines (Cypher 2000). Other species that may disperse along roads and invade adjacent habitat include mustards (*Brassica* species) and Russian thistle (*Salsola tragus*) (Tellman 1997).

Disturbed soils and reduced competition from native plants are some of the conditions that facilitate invasion along roads by non-native plant species. Nitrogen from vehicle exhaust is deposited in habitats adjacent to roads, and the resulting enhanced nitrogen levels appear to promote growth of non-native species, particularly exotic grasses (Weiss 1999). These grasses, such as red brome (*Bromus madritensis rubens*) create dense ground cover in the San Joaquin Valley, and this dense cover appears to reduce habitat quality for various small mammal species, such as kangaroo rats, which are an important prey for San Joaquin kit foxes (Goldingay *et al.* 1997; Cypher 2000).

Roads may serve as travel corridors for non-native red foxes. Red foxes can kill San Joaquin kit foxes (Ralls and White 1995; U.S. Fish and Wildlife Service 1998), and likely compete with kit foxes for food and dens. Red foxes are considered a threat to the swift fox in Canada (Carbyn 1999). Red foxes are infrequently observed in large blocks of undisturbed habitat within the range of the San Joaquin kit fox, possibly due to the absence of permanent water or the presence of coyotes which prey upon red foxes. Along roads, water availability may be higher due to pooling of precipitation runoff or anthropogenic development, and coyotes may be less abundant

due to the presence of humans. Roads may facilitate movements of red foxes and increase access to kit fox habitat. Non-native red foxes and feral cats (*Felis catus*) are reported to use roads as movement corridors in Australia (Bennett 1991).

Negative effects to wildlife populations from roads may extend some distance from the actual road. The phenomenon can result from any of the effects already described in this biological opinion (e.g. vehicle-related mortality, habitat degradation, invasive exotic species, etc.). Forman and Deblinger (1998) described the area affected as the "road effect" zone. Along a 4-lane road in Massachusetts, they determined that this zone extend for an average of approximately 980 feet to either side of the road for an average total zone width of approximately 1970 feet. However, in places they detected an effect > 0.6 mile from the road. Rudolph *et al* (1999) detected reduced snake abundance up to 2790 feet from roads in Texas. They estimated snake abundance out to 2790 feet, so the effect may have been greater. Extrapolating to a landscape scale, they concluded the effect of roads on snake populations in Texas likely was significant, given that approximately 79% of the land area of the Lone Star State is within 1640 feet of a road. The "road-zone" effects can be subtle. Van der Zandt *et al.* (1980) reported that lapwings (*Vanellus vanellus*) and black-tailed godwits (*Limosa limosa*) feeding at 1575-6560 feet from roads were disturbed by passing vehicles. The heart rate, metabolic rate and energy expenditure of female bighorn sheep (*Ovis canadensis*) increases near roads (MacArthur *et al.* 1979). Trombulak and Frossell (2000) described another type of "road-zone" effect. Heavy metal concentrations from vehicle exhaust were greatest within 66 feet of roads, by elevated levels of metals in both soil and plants were detected at ≥ 660 feet) of roads. The "road-zone" apparently varies with habitat type and traffic volume. Based on responses by birds, Forman (2000) estimated the effect zone along primary roads of 1000 feet in woodlands, 1197 feet in grasslands, and 2657 feet in natural lands near urban areas. Along secondary roads with lower traffic volumes, the effect zone was 656 feet. The "road zone" and the San Joaquin kit fox has not been adequately investigated; however, it is possible it exists given the effects of roads on the animal.

California Tiger Salamander

The proposed Pigeon Pass Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to dessication, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as racoons, crows, and ravens, to the sites, who could subsequently prey on the listed amphibian. Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or dessication (Stuart *et al.* 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their

movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander.

Construction related activities are likely to cause disruption of surface movement, disruption or complete loss of reproduction, harassment from increased human activity, and permanent and temporary loss of shelter. Because these animals are nocturnal, if construction is performed at night, associated lighting likely would increase all of the above effects. Wise and Buchanan (2002) reviewed the adverse effects that may result from night time illumination on salamander species. Artificial lighting used during night time construction may increase predation of the California tiger salamanders, if it occurs during periods of fall, winter, or spring rains, because the amphibians will lose the cover of darkness for movement. Nocturnal foraging by salamander species may be affected by artificial lighting. Wise and Buchanan (2002) reported that in one species of salamander, individuals emerged from refugia to forage within one hour after light levels dropped to dramatically following sunset. During such foraging bouts, visual information was used for locating prey. Greater light levels delay emergence, resulting in less foraging time, but could have increased the ability of the salamanders to capture prey; however, they also could make the amphibians more vulnerable to predation. Many salamanders, such as the California tiger salamander, are terrestrial as adults but migrate to ponds to breed and lay eggs. The orientation of some of these terrestrial species away from and toward these ponds is influenced by the spectral characteristics of light (Wise and Buchanan 2002). Artificial lights that emit unusual spectra may disrupt these migration patterns.

The loss of ground squirrel burrows will reduce the amount of available upland habitat within the action area. The loss of the breeding pond will result in significantly reduced breeding opportunities for the California tiger salamander. The addition of impermeable surfaces resulting from the widened realignment will be accompanied by an increase in chemical runoff, which would include gasoline and oil, as well as silt runoff, which will reduce water quality in the project site. A wider highway to cross during dispersal and migration likely will result in increased injury and mortality of California tiger salamanders, and increased fragmentation of their habitat in the action area.

The effect of habitat fragmentation on the California tiger salamander is potentially significant. Fragmentation can have two effects: (1) reduction in access to habitat as well as habitat suitability, and (2) disruption of movements, dispersal, and gene flow. The construction of roads through salamander habitat may restrict or block movement between breeding ponds and upland habitat. The likelihood of this effect will increase with larger road size, higher traffic volume, and the presence of fences or median barriers. In addition to limiting access to breeding ponds or upland habitat, roads also may reduce the suitability of habitat for the California tiger salamander by fragmentation into patches too small for effective use by the animals. As a habitat patch decreases in size, the number of California tiger salamanders the patch can support also decreases. This increases the probability that the animals will be extirpated from each habitat

patch. The possibility for recolonization will depend upon the nature of the factors, e.g., roads, canals, development, etc., that are causing the fragmentation.

Fragmentation factors that effectively isolate patches and limit access also constitute barriers to California tiger salamander dispersal, and gene flow. Movements and dispersal corridors between breeding ponds and upland habitat are critical to this animal's population dynamics, particularly because the animals currently persist as metapopulations with multiple disjunct population centers. Movement and dispersal corridors likely are important for alleviating overcrowding during years when California tiger salamander abundance is high, and also they are important for facilitating the recolonization of areas where the animal has been extirpated. Movement between population centers maintains gene flow and reduced genetic isolation. Genetically isolated populations are at greater risk of deleterious genetic effects such as inbreeding, genetic drift, and founder effects.

Roads have been documented as barriers to movements by a diversity of species, and this effect varies with road size and traffic volume. The inhibition of animal movements caused by roads produces a significant effect by fragmenting habitats and populations (Joly and Morand 1997). Roads were found to be significant barriers to gene flow among common frogs (*Rana temporaria*) in Germany and this has resulted in genetic differentiation among populations separated by roads (Reh and Seitz 1990). Similarly, significant genetic subdivision was detected in bank voles (*Clethrionomys glareolus*) populations separated by a 50-meter (164 foot) wide highway in Germany (Gerlach and Musolf 2000).

California tiger salamander mortality and injury occurs when the animals attempt to cross roads and are hit by cars, trucks, or motorcycles. The majority of strikes occur on rainy nights when the animals are moving to their breeding ponds. Thus, vehicle strikes are a direct source of mortality for the California tiger salamander. If vehicle strikes are sufficiently frequent in a given locality, this could result in reduced abundance of this animal. Especially problematic is the death of females prior to the laying of their eggs because this could result in the loss of an entire cohort, and therefore, reduced recruitment of new individuals into the population.

Vehicles constitute a consistent source of mortality for the animal, based on the frequency with which vehicle strikes occur. Although no systematic, range-wide studies have been conducted, it is known that significant numbers of California tiger salamanders are killed by vehicular traffic while crossing roads (Hansen and Tremper 1993; S. Sweet, *in litt.* 1993; Joe Medeiros, Sierra College, pers. comm. 1993). For example, during a 1-hour period on a road bordering Lake Lagunita on the Stanford University campus, 45 California tiger salamanders were collected, 28 of which had been killed by cars (Twitty 1941). More recently, during one 15-day period in 2001 at a Sonoma County location, 26 road-killed California tiger salamanders were found (D. Cook, pers. comm. 2002). Overall breeding population losses of California tiger salamanders due to road kills have been estimated to be between 25 and 72 percent (Twitty 1941; S. Sweet *in litt.* 1993; Launer and Fee *in litt.* 1996). Mortality may be increased by associated roadway curbs and berms as low as 3.5 to 5 inches, which allow California tiger salamanders access to roadways but prevent their exit from them (Launer and Fee 1996; S. Sweet *in litt.* 1998).

In a recent study along a 0.7 mile high-vehicular-use (21,450 vehicles per day) section of the Trans-Canadian Highway in Alberta, Canada, Clevenger *et al.* (2001) recorded 183 road-killed eastern tiger salamanders in 30 days and concluded it was likely that very little of the local population had survived. In California, vehicular-use levels along various State, interstate, and secondary roads commonly far exceed the level of use reported in the Alberta study. Vehicular usage on California roads is also increasing rapidly and directly with human population and urban expansion. During November 2002, California's estimated total vehicular travel on State highway system roads alone was 14.27 billion miles (this figure and subsequent vehicular-use data from California Department of Transportation's Internet website which was accessed on January 2, 2003). From 1972 to 2001, State highway system total vehicular usage rose steadily from 67.11 to 167.81 billion miles annually. For the 23 California counties in which the California tiger salamander may occur, State highway system total annual vehicular usage in 1999, 2000, and 2001 was 53.27, 55.85, and 57.21 billion miles, respectively. The steady increase of vehicular use is thus continuing. We believe such figures illustrate (1) the general increase in vehicular usage that has been, and is still, occurring in many parts of the California tiger salamander's range, and (2) that additional increments of road-kill losses, which are already a potentially serious problem for the species, are likely occurring.

Vehicle-related mortality has significantly affected other listed or rare species. Rudolph *et al.* (1999) estimated that road-associated mortality may have depressed populations of Louisiana pine snakes (*Pituophis ruthveni*) and timber rattlesnakes (*Crotalus horridus*) by over 50% in eastern Texas, and this mortality may be a primary factor in local extirpations of this species of rattlesnake (Rudolph *et al.* 1998). Mortality from vehicles also is contributing to the reduction in the status of the prairie garter snake (*Thamnophis radix radix*) in Ohio (Dalrymple and Reichenbach 1984), and was a limiting factor in the recovery of the endangered American crocodile (*Crocodylus acutus*) in Florida (Kushland 1998).

Similar to the endangered San Joaquin kit fox California red-legged frog, the presence of roads could introduce chemical agents that contaminate and adversely affect the California tiger salamander and its prey; introduce or improve habitat for non-native species that compete or prey upon this listed amphibian; and also the "road zone" effect may adversely affect this listed animal.

California Tiger Salamander Proposed Critical Habitat

The proposed action is not expected to appreciably diminish the value of the proposed critical habitat for the California tiger salamander, or prevent the proposed critical habitat from sustaining its role in the conservation and recovery of the species. The California Department of Transportation is proposing to implement measures to restore the areas subject to a significant amount of cut and fill to pre-project conditions. There is currently an existing highway within the action area, and, due to the proposed restoration activities, realigning a section of that highway will not significantly interfere with the current capability of the proposed critical habitat to satisfy essential requirements of the species. Constituent elements for the California tiger salamander will remain intact during and after project completion, or will be restored, and will continue to provide suitable habitat.

California Red-legged Frog

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County.

Changes in light level may disrupt orientation in nocturnal animals. The range of anatomical adaptations to allow night vision is broad (Park 1940), and rapid increases in light can blind animals. For frogs, a quick increase in illumination causes a reduction in visual capability from which the recovery time may be minutes to hours (Buchanan 1993). After becoming adjusted to a light, frogs may be attracted to it as well (Jaeger and Hailman 1973). Laboratory experiments have demonstrated that dark-adapted frog species exposed to rapid increases in illumination may be temporarily "blinded" and unable to gather visual information on prey, predators, or conspecifics until their eyes adapt to the new illumination. Foraging may be facilitated in frog species that hunt around lights because the ambient illumination is increased to a level that allows the frogs to see prey or because lights attract abnormally large numbers of insects and other invertebrate prey. Experiments and anecdotal evidence indicates that both temporary and permanent changes to the night time illumination of an area may affect the reproduction, foraging, predator avoidance, and social interactions of frog species (Buchanan 2002). Reproductive behaviors may be altered by artificial lighting; it may be inhibited in frog species that normally reproduce only at very low illuminations. Female frogs of the species *Physalaemus pustulosus* are less selective about mate choice when light levels are increased, evidently preferring to mate quickly and avoid the increased predation risk of mating activity (Rand *et al.* 1997). Longcore and Rich (2002) reported that frogs in an experimental enclosure stopped mating activity during night football games, when lights from a nearby stadium increased sky glow. Mating choruses only resumes when the enclosure was covered to shield the frogs from light. Increased illumination may allow predators to see frogs that may not normally be visible to them. Circadian rhythms, activity patterns, and intraspecific visual communication also may be affected by increased illuminations.

Breeding habitat, identified as Site 1, will be eliminated by the proposed project. Individual frogs occupying the affected habitat run the risk of being crushed or buried by earth moving activities. Those that do survive will suffer permanent and temporary loss of habitat, and harassment from increased human activity. Construction of an unspecified duration and location will occur at night and the associated lighting may increase predation because frogs will lose the cover of darkness. In addition to the elimination of the breeding pond identified as Site 1, at certain times during construction the movement of frogs from breeding ponds north of State Route 84 to summer habitat south of State Route 84, and visa versa, likely will be impeded by construction activities. Temporary loss of dispersal habitat for the project duration increases

intra-and interspecific competition for food and living space for red-legged frogs in the action area.

The proposed action is likely to result in indirect effects to the red-legged frog that will last beyond the completion of the proposed action. The action would (1) result in permanent and temporal loss of aestivation habitat; (2) reduce water quality in the action area; (3) result in higher mortality of red-legged frogs in the action area; and (4) increase fragmentation of remaining red-legged frog habitat over the longer term.

Similar to the endangered San Joaquin kit fox and the California tiger salamander, the presence of roads could introduce chemical agents that contaminate and adversely affect the California red-legged frog and its prey; introduce or improve habitat for non-native species that compete or prey upon this listed amphibian; and also the "road zone" effect may adversely affect this listed animal.

The addition of impermeable surfaces resulting from the widened realignment will be accompanied by an increase in chemical runoff, which would include gasoline and oil, as well as silt runoff, which will reduce water quality in the project site. The widening of State Route 84 will likely result in higher mortality due to the increased distance that red-legged frogs have to travel over the highway to cross it. Removal of vegetation will likely increase exposure to introduced non-native and/or urban-adapted predators due to the permanent and temporary loss of cover to dispersing red-legged frogs.

California Red-Legged Frog Proposed Critical Habitat

The proposed action is not expected to appreciably diminish the value of the proposed critical habitat for the red-legged frog, or prevent proposed critical habitat from sustaining its role in the conservation and recovery of the species. The California Department of Transportation is proposing to implement measures to restore the areas subject to a significant amount of cut and fill to pre-project conditions. There is currently an existing highway within the action area, and, due to the proposed restoration activities, realigning a section of that highway will not significantly interfere with the current capability of the proposed critical habitat to satisfy essential requirements of the species. Constituent elements for the red-legged frog will remain intact during and after project completion, or will be restored, and will continue to provide suitable habitat.

Vernal Pool Fairy Shrimp

Vernal pool fairy shrimp may be directly injured, killed, harmed, and harassed by activities that damage their vernal pool habitat. The proposed project would directly eliminate 0.84 acre of vernal pools that provides habitat for this species, and fragment and reduce the acreage of the remaining for this listed crustacean habitat located in Alameda County.

The potential adverse effects of the proposed Pigeon Pass Project include habitat fragmentation; altered hydrology; non-point source pollution; dust emissions; erosion; sedimentation; hazardous material spills; human disturbance; and establishment of invasive nonnative plants. The project could potentially result in habitat fragmentation. The results of fragmentation are inhibition of genetic exchange between populations and impediments to recolonization of habitats from which populations have been extirpated. Small, isolated populations are substantially more vulnerable to stochastic events (e.g., aberrant weather patterns, fluctuations in availability of food) and may exhibit reduced adaptability to environmental (natural or anthropogenic) changes.

The Service considers all vernal pool branchiopods and their habitat not considered to be directly affected but within 250 feet of proposed construction activities to be indirectly affected by project implementation. Habitat indirectly affected includes all habitat supported by future destroyed areas and swales, and all habitat otherwise damaged by loss of watershed, human intrusion, introduced species, and pollution that will be caused by the proposed project. The proposed project will directly affect 0.61 acre and 0.2 acre of vernal pool will be indirectly affected by the proposed project. The new alignment will affect the vernal pool fairy shrimp through construction activities and long-term effects occurring within 250 feet of it. Individual branchiopods and their cysts, which may inhabit this seasonal wetland, may be injured or killed by any of the following indirect effects:

Erosion - The ground disturbing activities in the watershed of vernal pools associated with the proposed project action area are expected to result in siltation when pools fill during the wet season following construction. Siltation in pools supporting vernal pool fairy shrimp may result in decreased cyst viability, decreased hatching success, and decreased survivorship among early life history stages, thereby reducing the number of mature adults in future wet seasons. The proposed project construction activities could result in increased sedimentation transport into vernal pool branchiopod habitats during periods of heavy rains.

Changes in hydrology - The biota of vernal pools and swales can change when the hydrologic regime is altered (Bauder 1986, 1987). Survival of aquatic organisms like the vernal pool fairy shrimp are directly linked to the water regime of their habitat (Zedler 1987). Therefore, construction near vernal pool areas will, at times, result in the decline of local sub-populations of vernal pool organisms, including fairy shrimp.

Introduction of non-natives - There is an increased risk of introducing weedy, non-native plants into the vernal pools both during and after project construction due to the soil disturbance from clearing and grubbing operations, and general vegetation disturbance associated with the use of heavy equipment.

Chemical contamination - The runoff from chemical contamination can kill listed species by poisoning. Oils and other hazardous materials associated with construction equipment could be conveyed into the habitat of the vernal pool fairy shrimp by overland runoff during the rainy season, thereby adversely affected water quality. Many of these chemical compounds are thought to have adverse effects on this species. Individuals may be killed directly or suffer reduced

fitness through physiological stress or a reduction in their food base due to the presence of these chemicals.

In addition to the adverse effects detailed above, the proposed project will contribute to a local and range-wide trend of habitat loss and degradation, the principal reasons that the vernal pool fairy shrimp have declined. The proposed project will contribute to the fragmentation and reduction of the acreage of the remaining listed vernal pool branchiopod habitat located in western Alameda and throughout the range of this listed vernal pool branchiopod.

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.

From 1995 to 2020, the human population is projected to increase by 18 percent for the San Francisco Bay hydrologic region, while at the same time agricultural crop land use in the region is projected to remain around 65,000 acres (California Department of Water Resources 998). According the California Department of Forestry, from 2000 to 2020, the human population within counties in the Bay Area region is expected to grow by 29 percent (5.3 million people to 6.8 million people), and by 60 percent from 2000 to 2040 (5.3 million people to 8.4 million people) (California Department of Forestry 1998). There will likely be many other development projects that occur during this timeframe due to increases in human population growth that will continue to imperil the California tiger salamander, San Joaquin kit fox, California red-legged frog, and the vernal pool fairy shrimp.

The California Department of Parks and Recreation's Carnegie State Park is operated for use by off-highway vehicles. This State Park unit is located approximately 10 miles east of the Pigeon Pass Project along Corral Hollow Creek. Ongoing habitat degradation by off road vehicle use will continue to marginalize the available upland and riparian habitat along Corral Hollow Creek. Presently, there are plans to expand Carnegie State Park; any expansion of this Park could exacerbate the degradation of habitat in this area.

Within this region of Alameda County, there is a continued demand for new housing. Considering this, the remaining open space adjacent to the Pigeon Pass Project is likely threatened by development. Two developments, Ruby Hills and Vineyard Estates have already been constructed adjacent to the project site. The development of adjacent wildlife habitat will continue to result in the loss of not only breeding, resting, and foraging habitat, but the loss of dispersal corridors between breeding populations, thereby further isolating and fragmenting wildlife populations. Additionally, development of small reservoirs or water bodies, such as golf course hazards, and water diversions may occur which may pose further threats such as disruption of dispersal corridors for terrestrial species, and competition or predation from with non-native species such as bullfrogs for aquatic species.

CONCLUSION

After reviewing the current status of the vernal pool fairy shrimp, California tiger salamander, California red-legged frog, and the San Joaquin kit fox, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the Pigeon Pass Project is not likely to jeopardize the continued existence of these four listed species. Critical habitat for the San Joaquin kit fox has not been proposed or designated, therefore, none will be affected by the proposed project. Critical habitat for the vernal pool fairy has been designated, however none is located in the action area, and therefore none will be affected by the proposed project. Critical habitat has been proposed for the California tiger and the California red-legged frog, however none will be adversely modified or destroyed. The Service reached the conclusion on the effects on the proposed critical habitat of the California red-legged frog and the California tiger salamander because the effects of the project will be offset by the conservation measures in the project description, including the successful restoration of areas subject to the temporary effects of cut and fill to pre-project conditions.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as 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 California Department of Transportation so they become binding conditions of project authorization for the exemption under 7(o)(2) to apply. The California Department of Transportation has a continuing duty to regulate the activity that is covered by this incidental take statement. If the California Department of Transportation (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of 7(o)(2) may lapse.

Amount or Extent of Take

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity,

it inhabits dens or burrows, the animal may range over a large territory, it is primarily active at night, it is a highly intelligent animal that is often is extremely shy around humans, and the finding of an injured or dead individual is unlikely because of their relatively small body size, Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17. acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to located in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment and based on the November 8, 2004, site visit, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the San Joaquin kit fox, California red-legged frog, California tiger salamander. Critical habitat for the San Joaquin kit fox has not been proposed or designated, therefore, none will be affected by the proposed project. Critical habitat for the vernal pool fairy has been designated, however none is located in the action area, and therefore will not be affected by the proposed project. Critical habitat has been proposed for the California tiger and the California red-legged frog, however none will be adversely modified or destroyed based on the proposed restoration of the areas subject to temporary disturbance.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the effects of the Pigeon Pass Project on the San Joaquin kit fox, California tiger salamander, California red-legged frog, and the vernal pool fairy shrimp:

1. The California Department of Transportation shall implement conservation measures for the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp to minimize (1) the effects of the loss of habitat that will occur as a result of the project; (2) the potential for harassment, harm, injury, and mortality to these four listed species; and (3) the potential for inadvertent capture or entrapment of federally listed wildlife species during construction activities.
2. The California Department of Transportation shall ensure their compliance with this biological opinion.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Federal Highway Administration shall ensure the California Department of Transportation complies with the

following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

- A. The following Term and Conditions will implement Reasonable and Prudent Measure number one (1):
1. The California Department of Transportation shall minimize the potential for incidental take of the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp resulting from project related activities by implementation of the conservation measures as described in the Biological Assessment, the letter from the California Department of Transportation to the Service dated February 15, 2005, and appearing in the *Project Description* of this biological opinion.
 2. The California Department of Transportation shall include Special Provisions that include the avoidance and minimization measures of this biological opinion in the solicitation for bid information. In addition, the California Department of Transportation will educate and inform contractors involved in the project as to the requirements of the biological opinion.
 3. As described in the February 15, 2005, letter from the California Department of Transportation to the Service, the 52 acres that will be purchased for the San Joaquin kit fox and the California tiger salamander via the Service's San Joaquin Kit Fox Fund shall be acquired within the geographic area inhabited by the same population segment of the California tiger salamander known as the East Bay Unit that is being adversely affected by the Pigeon Pass Project.
 4. As described in the February 15, 2005, letter from the California Department of Transportation to the Service, prior to the initiation of groundbreaking activities associated with the implementation of the proposed project, the California Department of Transportation shall compensate for direct effects to the habitat of the vernal pool fairy shrimp by purchasing, at a Service-approved conservation bank, for preservation credits that are equivalent of 1.45 acres of suitable vernal pool habitat for this listed species. Prior to the initiation of groundbreaking activities associated with the implementation of the proposed project, the California Department of Transportation shall compensate for direct effects to the habitat of the vernal pool fairy shrimp by purchasing, at a Service-approved conservation bank, for creation credits that are equivalent of 0.61 acre of suitable vernal pool habitat for this listed species.
 5. The California Department of Transportation biologist shall have oversight over implementation of all the Terms and Conditions in this biological opinion, and shall have the authority to stop project activities, through communication with the California Department of Transportation Resident Engineer, if any of the requirements associated with these Terms and Conditions are not being fulfilled.

- If biologist/construction liaison has requested a stop work due to take of any of the listed species the Service and Fish and Game will be notified within one (1) working day via email or telephone
6. Permanent and temporary construction disturbances and other types of project-related disturbance to San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp habitat shall be minimized to the maximum extent practicable. To minimize temporary disturbances, all project-related vehicle traffic shall be restricted to established roads, construction areas, and other designated areas. These areas also should be included in preconstruction surveys and, to the maximum extent possible, should be established in locations disturbed by previous activities to prevent further adverse effects.
 7. Project employees shall be directed to exercise caution when commuting within the habitats of the California tiger salamander, California red-legged frog, and the San Joaquin kit fox. A 20-mile per hour speed limit will be strongly encouraged on unpaved roads within listed species habitats.
 8. Cross-country travel by vehicles shall be prohibited, unless authorized by the Service.
 9. Project employees shall be provided with written guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.
 10. Prior to initiation of ground breaking, the California Department of Transportation or Service-approved biologist will conduct an education and training session for all construction personnel. All individuals who will be involved in the site preparation or construction shall be present, including the project representative(s) responsible for reporting take to the Service and the California Department of Fish and Game. Training sessions shall be repeated for all new employees before they access the project site. Sign up sheets identifying attendees and the contractor/company they represent shall be provided to the Service with the post-construction compliance report. At a minimum, the training shall include a description of the natural history of the San Joaquin kit fox, California tiger salamander, California red-legged frog, and the vernal pool fairy shrimp affected by the Pigeon Pass Project and include information on these four listed species and their habitats, as appropriate. The training shall include the general measures that are being implemented to conserve these species as they relate to the project, the penalties for non-compliance, and the boundaries (work area) of the project. To ensure that employees and contractors understand their roles and responsibilities, training shall be conducted in languages other than English, as appropriate.

11. A litter control program shall be instituted at the entire Pigeon Pass Project. All workers ensure their food scraps, paper wrappers, food containers, cans, bottles, and other trash from the project area are deposited in covered or closed trash containers. The trash containers shall be removed from the project area at the end of each working day.
12. No canine or feline pets or firearms (except for Federal, State, or local law enforcement officers and security personnel) shall be permitted at the Pigeon Pass Project to avoid harassment or killing or injuring of the San Joaquin kit fox, California red-legged frog, and the California tiger salamander.
13. All construction activity shall be confined within the Pigeon Pass Project site, which may include temporary access roads, haul roads, and staging areas specifically designated and marked for these purposes, as described in Conservation Condition 18 below. At no time shall equipment or personnel be allowed to adversely affect areas outside the project site without authorization from the Service.
14. The Resident Engineer or their designee shall be responsible for implementing these conservation measures and shall be the point of contact for the Pigeon Pass Project.
15. All grindings and asphaltic-concrete waste shall be stored within previously disturbed areas absent of habitat and at a minimum of 150 feet from any culvert, wash, pond, vernal pool, or stream crossing.
16. The California Department of Transportation shall submit to the Service their draft proposal for the restoration of temporarily affected listed species habitat and proposed critical habitat to pre-project conditions at least sixty (60) calendar days prior to initial ground breaking at the Pigeon Pass Project; the final plan shall be submitted for approval by the Service prior to ground breaking at the proposed project. The plan shall include restoration and revegetation work associated with temporary effects using native California plant species from on-site or local sources (i.e., local ecotype). Plant materials from non-local sources shall be allowed only with written authorization from the Service. To the maximum extent practicable (i.e., presence of natural lands), topsoil shall be removed, cached, and returned to the site according to successful restoration protocols. Loss of soil from run-off or erosion shall be prevented with straw bales, straw wattles, or similar means provided they do not entangle, block escape or dispersal routes of listed animal species. The draft and final plan shall contain specific quantifiable criteria to evaluate the success of the restoration.
17. The Pigeon Pass Project construction area shall be delineated with high visibility temporary fencing at least four (4) feet in height, flagging, or other barrier to

- prevent encroachment of construction personnel and equipment onto any sensitive areas during project work activities. Such fencing shall be inspected and maintained daily until completion of the project. The fencing will be removed only when all construction equipment is removed from the site. Actions within the project area shall be limited to vehicle and equipment operation on existing roads. No project activities will occur outside the delineated project construction area.
18. Prior to any ground disturbance, pre-construction surveys shall be conducted for San Joaquin kit fox, California tiger salamander, and the California red-legged frog. These surveys shall consist of walking surveys of the project limits and adjacent areas accessible to the public to determine presence of the species (i.e., kit fox dens and related sign).
 19. Only California Department of Transportation biologist(s) who are familiar with the biology and ecology of the San Joaquin kit fox, California tiger salamander, or the California red-legged frog, or a Service-approved biologist holding valid permit issued pursuant to section 10(a)(1)(A) of the Act will be allowed to capture listed species.
 20. Because dusk and dawn are often the times when San Joaquin kit fox, California red-legged frog, and the California tiger salamander are most actively foraging and dispersing, all construction activities should cease one half hour before sunset and should not begin prior to one half hour before sunrise. Except when necessary for necessary construction, driver or pedestrian safety, lighting of the Pigeon Pass Project site by artificial lighting during night time hours should be minimized to the maximum extent practicable.
 21. Maintenance and construction excavations greater than two (2) feet deep either shall be covered or filled in at the end of each working day. Wooden ramps or other structures of suitable surface that provide adequate footing for the San Joaquin kit fox shall be placed in the trench or pit no greater than 200 feet apart to allow for unaided escape. The trench or pit shall be surveyed in the morning and late afternoon hours to ascertain whether the San Joaquin kit fox, California red-legged frog, and the California tiger salamander have fallen into the trench or pit. If at anytime, a trapped San Joaquin kit fox is discovered, the California Department of Transportation biologist shall immediately place escape ramps or other appropriate structures to allow the animal to escape, or the Service and/or the California Department of Fish and Game contacted for further guidance. If a California red-legged frog or California tiger salamander is discovered trapped in a trench or pit, the animal shall be carefully captured by the California Department of Transportation biologist and released at a secure location, such as the entrance to a ground squirrel burrow, within walking distance and is outside of the construction area. The Service shall be notified by telephone and electronic mail within one (1) working day of the incident.

22. Tightly woven fiber netting or similar material shall be used for erosion control or other purposes at the Pigeon Pass Project site to ensure that the California red-legged frog and the/or the California tiger salamander do not get trapped. This limitation will be communicated to the contractor through use of Special Provisions included in the bid solicitation package.
23. Use of rodenticides and herbicides at the Pigeon Pass Project site shall be utilized in such a manner to prevent primary or secondary poisoning of listed species, and the depletion of prey populations on which they depend. All uses of such compounds shall observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Pesticide Regulation, and other appropriate State and Federal regulations, as well as additional project-related restrictions deemed necessary by the Service or the California Department of Fish and Game.
24. The following Term and Condition shall be implemented for borrow sites associated with the Pigeon Pass Project:
 - a. The California Department of Transportation shall require as part of the construction contract that all contractors comply with the Act in the performance of the work necessary for project completion performed inside and outside the project right-of-way.
 - b. The California Department of Transportation shall require documentation from the contractor that aggregate, fill, or borrow material provided for each project was obtained in compliance with the Act. Evidence of compliance with the Act shall be demonstrated by providing the Resident Engineer any one of the following:
 - i. a letter from the Service stating use of the borrow pit area will not result in the incidental take of listed species;
 - ii. an incidental take permit for contractor-related activities issued by the Service pursuant to section 10(a)(1)(B) of the Act;
 - iii. a biological opinion or a letter concurring with a "not likely to adversely affect" determination issued by the Service to the Federal agency having jurisdiction over contractor-related activities;
 - iv. letter from the Service concurring with the "no effect" determination for contractor-related activities; or
 - v. Contractor submittal of information to the California Department of Transportation Resident Engineer indicating compliance with the State Mining and Reclamation Act (SMARA) and provide the County land use permits and California Quality Act (CEQA) clearance.

- c. If a borrow site that is in compliance with the Act is not available, the California Department of Transportation shall either:
 - i. identify/select a site that the Service has concurred with the "no effect" determination, or;
 - ii. request reinitiation of formal consultation on the action considered herein based on new information.
25. The California Department of Transportation shall implement the following six general conservation measures for the San Joaquin kit fox:
- a. The presence/absence of San Joaquin kit fox dens (natural or in pipes and culverts) shall be determined.
 - i. Pre-construction surveys within the project area shall be conducted no more than thirty (30) calendar days prior to the start of construction in accordance with the most current protocols approved by the Service and the California Department of Fish and Game.
 - ii. Surveys for dens shall be conducted by qualified biologists with demonstrated experience in identifying San Joaquin kit fox dens.
 - iii. Pipes and culverts shall be searched for kit foxes prior to being moved or sealed to ensure that a San Joaquin kit fox has not been trapped.
 - b. All San Joaquin kit fox dens shall be protected to the maximum extent practicable as determined by the on-site biologist in consultation with the Service.
 - c. The type of den (natal or non-natal) and its status (occupied or unoccupied) shall be identified based on the most current Service guidance (U.S. Fish and Wildlife Service 1999):
 - i. Known den: any existing natural den or human-made structure for which conclusive evidence or circumstantial evidence can show that the den is used or has been used at any time in the past by the San Joaquin kit fox.
 - ii. Potential den: any natural den or burrow within the range of the species that has entrances of appropriate dimensions (4 to 12 inches in diameter) to accommodate San Joaquin kit foxes. The California Department of Transportation shall survey and investigate using photo-detection equipment, track plate, or other

- methods to determine species utilization. If no information is collected that would indicate use by other species, the den shall be treated as a potential kit fox den.
- iii. Pupping den: any known San Joaquin kit fox den (as defined) used by kit foxes to whelp and/or rear their pups.
 - iv. Atypical den: any known San Joaquin kit fox den that has been established in, or in association with, a human-made structure.
- d. The California Department of Transportation shall identify and execute appropriate action(s) regarding notification, buffers, excavation and fill, or seal-off of burrows of this listed species:
- i. Occupied natal den: if an occupied natal den is visible or encountered within the project limits, or other accessible land, or on accessible land within 1000 feet of the project construction area, the Service shall be contacted immediately, before any project action occurs, and the project construction should take place between August 1 and November 30.
 - ii. An adequate buffer or exclusion zone shall be established to protect the physical den and surrounding habitat of unoccupied natal dens and all non-natal dens that can be avoided:
- e. Unoccupied natal dens should be surrounded with a 200 feet buffer and the Service shall be contacted. Occupied and unoccupied non-natal dens should be surrounded with a minimum 100-foot buffer zone.
- f. When occupied dens have been found on or near the project site, ground disturbing activities should be restricted during the period from August 1 and November 30. During this time period, project activities within 0.3 mile of occupied natal dens should be prohibited. Buffer zones shall be delineated with a temporary fence or other suitable barrier that does not prevent movement and dispersal of the San Joaquin fox. Alternately, the project construction area can be delineated with temporary fence, flagging, or other barrier.
- g. Prior to their use, pipes or culverts with a diameter greater than 4 inches at the project site shall be examined by the California Department of Transportation biologist to ascertain if any San Joaquin kit foxes are present in them. Any San Joaquin kit fox found in a pipe or culvert shall be allowed to escape unimpeded.

- h. If an unoccupied natural San Joaquin kit fox den cannot be avoided and must be destroyed, the following actions shall be followed:
 - i. Prior to the destruction of any den, the den shall be monitored for at least three (3) consecutive days to determine its current status. Activity at the den shall be monitored by placing tracking medium at the entrance and by standard spotlighting detection techniques. If no San Joaquin kit fox activity is observed during this period, the den shall be destroyed immediately to preclude subsequent use. If San Joaquin kit fox activity is observed at the den during this period, the den shall be monitored for at least five (5) consecutive days from the time of observation to allow any resident animal to move to another den during its normal activities. Use of the den can be discouraged during this period by partially plugging the entrance(s) with soil in such a manner that any resident animal can escape easily. Destruction of the den may begin when, in the judgment of a Service or Service-approved biologist, the animal has moved to a different den. The biologist shall be trained and familiar with San Joaquin kit fox biology. If the animal is still present after five or more consecutive days of plugging and monitoring, the den may be excavated when, in the judgment of the Service-approved biologist, it is temporarily vacant, for example during the animal's normal foraging activities.
 - ii. All San Joaquin kit dens shall be excavated by hand, by or under the supervision of, a Service-approved biologist.
 - iii. The den shall be fully excavated and then filled with dirt and compacted to ensure that San Joaquin kit foxes cannot reenter or use the den during the construction period. If, at any point during excavation a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den shall be resumed. Destruction of the den may be resumed, when in the judgment of the Service-approved biologist, the animal has escaped from the partially destroyed den.
 - iv. Non-natal San Joaquin kit dens may be excavated at any time of the year; natal dens shall be excavated only between August 15 and November 1.

B. The following Terms and Conditions implement Reasonable and Prudent Measure two (2):

1. If requested, during or upon completion of construction activities, the on-site biologist, and/or a representative from California Department of Transportation shall accompany Service or California Department of Fish and Game personnel on

an on-site inspection of the site to review project effects to the San Joaquin kit fox, California red-legged frog, California tiger salamander, vernal pool fairy shrimp, and their habitats.

2. The Federal Highway Administration shall ensure California Department of Transportation complies with the *Reporting Requirements* of this biological opinion.

Reporting Requirements

Injured San Joaquin kit foxes, California red-legged frogs, and/or California tiger salamanders must be cared for by a licensed veterinarian or other qualified person; dead individuals of any of these three listed species and the vernal pool fairy shrimp should be preserved according to standard museum techniques and held in a secure location. The Service and the California Department of Fish and Game must be notified within one (1) working day of the discovery of death or injury to a San Joaquin kit fox, California red-legged frog, California tiger salamander, and/or vernal pool fairy shrimp that occurs due to project related activities or is observed at the project site. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal 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. The Service contacts are Chris Nagano, Chief of the Endangered Species Division (Central Valley) at the Sacramento Fish and Wildlife Office (916/414-6600), and Scott Heard, Resident Agent-in-Charge of the Service's Law Enforcement Division at 916/414-6660. The California Department of Fish and Game contact is Mr. Ron Schlorff at 1416 9th Street, Sacramento, California 95814, (916) 654-4262.

The California Department of Transportation shall submit a post-construction compliance report prepared by the on-site biologist to the Sacramento Fish and Wildlife Office within sixty (60) 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 compensation and other conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp, if any; (v) occurrences of incidental take of any of these four listed species, if any; and (vi) 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 to implement recovery actions, to help implement recovery plans, to develop information, or otherwise further the purposes of the Act.

For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation

of any conservation recommendations. We propose the following conservation recommendations:

1. The California Department of Transportation should assist the Service in implementing recovery actions identified in the *Recovery Plan for the California red-legged Frog* (U.S. Fish and Wildlife Service 2002).
2. The California Department of Transportation should assist the Service in developing and implementing recovery actions identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (U.S. Fish and Wildlife Service 1998).
3. The California Department of Transportation should incorporate culverts, tunnels, or bridges on highways and other roadways that allow safe passage by California tiger salamanders, California red-legged frogs, San Joaquin kit foxes, other listed animals, and wildlife. The California Department of Transportation should include photographs, plans, and other information in their biological assessments if they incorporate "wildlife friendly" crossings into their projects.
4. The Federal Highway Administration and the California Department of Transportation should consider participating in the planning for a regional habitat conservation plan for the San Joaquin kit fox, California tiger salamander, other listed species, and sensitive species.
5. The California Department of Transportation should consider establishing functioning preservation and creation conservation banking systems to further the conservation of the California tiger salamander, San Joaquin kit fox, listed crustacean species, and other appropriate species. Such banking systems also could possibly be utilized for other required mitigation (i.e., seasonal wetlands, riparian habitats, etc.) where appropriate.
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.
7. The California Department of Transportation should provide habitat for bats, including surfaces for bat roosts on the underside of bridges and other structures whenever possible.

REINITIATION - CLOSING STATEMENT

This concludes the conference for effects of the proposed addition of truck climbing lanes and curve corrections to State Route 84 (Pigeon Pass Project) in Alameda County, California, on the critical habitats for the California red-legged frog and California tiger salamander. You may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if either of these critical habitats are designated. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in

the action as planned or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion on the project and no further section 7 consultation will be necessary.

This concludes formal consultation on the proposed addition of truck climbing lanes and curve corrections to State Route 84 (Pigeon Pass Project) in Alameda County, California. 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, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this biological opinion on the Pigeon Pass Project, please contact the Chief of our Endangered Species Division (Central Valley) at the letterhead address or at telephone 916/414-6600.

Sincerely,



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Cay C. Goude
Acting Field Supervisor

cc:

Susan Chang, Jeff Jensen, California Department of Transportation, Oakland, California
Larry Eng, California Department of Fish and Game, Rancho Cordova, California
Dee Warenycia, California Department of Fish and Game, Sacramento, California
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United States Department of the Interior

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APR 27 2005

Mr. Gene Fong
Federal Highway Administration
U. S. Department of Transportation
650 Capitol Mall, Suite 4-100
Sacramento, California 95814

RY -
Review - File
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Subject: Amendment to Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 1-1-04-F-0115)

Dear Mr. Fong:

This letter is an amendment to the biological opinion and conference opinion issued for the proposed Pigeon Pass Curve Realignment Project located in Alameda County, California. At issue are the effects of the project on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), threatened California red-legged frog (*Rana aurora draytonii*), threatened California tiger salamander (*Ambystoma californiense*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*), and proposed critical habitats for the California red-legged frog and the California tiger salamander. This amended biological and conference opinion is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

This amended biological and conference opinion is based on: (1) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment Project, Southwest of Livermore, Alameda County, California (1-1-04-F-0115)* dated February 28, 2005, that was prepared by the U.S. Fish and Wildlife Service (Service); (2) a request for an amendment to the Biological Opinion from the Federal Highway Administration, dated March 28, 2005; (3) an April 1, 2005, phone discussion with Chris Collison of Caltrans concerning the distribution of vernal pool fairy shrimp mitigation funds; (4) an additional request for an amendment to the Biological Opinion from the Federal Highway Administration, dated April 15, 2005; and (5) other information available to the Service.

The following changes are made to the February 28, 2005, biological and conference opinion:

1. Change Avoidance and Protection Measures - Listed Species on page 6 from:

The California Department of Transportation will divide the 132 acres of compensation habitat for the San Joaquin kit fox and the California tiger salamander, by purchasing 80

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credit acres for the California tiger salamander and providing payment for 52 acres into the Service's San Joaquin Kit Fox Fund. The California Department of Transportation is proposing to purchase 80 acres of conservation credit at the Ohlone Conservation Bank. The California Department of Transportation will pay \$650,000.00 (52 acres x \$12,500/acre) into the San Joaquin Kit Fox Fund.

To:

The California Department of Transportation will divide the 132 acres of compensation habitat for the San Joaquin kit fox and the California tiger salamander, by purchasing 80 credit acres for the California tiger salamander. For the remaining 52 acres, Caltrans will set aside \$650,000.00 (52 acres x \$12,500/acre), which will be held until a Service-approved conservation bank becomes available. At that time, the California Department of Transportation will expend the \$650,000 to purchase credits at the bank.

2. Change Term and Condition A1 page 64 from

The California Department of Transportation shall minimize the potential for incidental take of the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp resulting from project related activities by implementation of the conservation measures as described in the Biological Assessment, the letter from the California Department of Transportation to the Service dated February 15, 2005, and appearing in the *Project Description* of this Biological Opinion.

To:

The California Department of Transportation shall minimize the potential for incidental take of the San Joaquin kit fox, California red-legged frog, California tiger salamander, and the vernal pool fairy shrimp resulting from project related activities by implementation of the conservation measures as described in the Biological Assessment, the letter from the California Department of Transportation to the Service dated February 15, 2005, the letter from the Federal Highway Administration dated March 28, 2005, the letter from the Federal Highway Administration dated April 15, 2005, and appearing in the *Project Description* of this Biological Opinion.

3. Change Term and Condition A3 page 64 from

As described in the February 15, 2005, letter from the California Department of Transportation to the Service, the 52 acres that will be purchased for the San Joaquin kit fox and the California tiger salamander via the Service's San Joaquin Kit Fox Fund shall be acquired within the geographic area inhabited by the same population segment of the California tiger salamander known as the East Bay Unit that is being adversely affected by the Pigeon Pass Project.

To:

As described in the March 28, 2005, letter from FHWA to the Service, the California Department of Transportation will reserve \$650,000 in an internal account for future funding to be used to conserve habitat for both the San Joaquin kit fox and the East Bay Unit of the California tiger salamander. The funds shall be released by Caltrans upon written instructions from the Sacramento Fish and Wildlife Office.

4. Change Term and Condition A4 page 64 from

As described in the February 15, 2005, letter from the California Department of Transportation to the Service, prior to the initiation of groundbreaking activities associated with the implementation of the proposed project, the California Department of Transportation shall compensate for direct effects to the habitat of the vernal pool fairy shrimp by purchasing, at a Service-approved conservation bank, for preservation credits that are equivalent of 1.45 acres of suitable vernal pool habitat for this species. Prior to the initiation of groundbreaking activities associated with the implementation of the proposed project, the California Department of Transportation shall compensate for direct effects to the habitat of the vernal pool fairy shrimp by purchasing, at a Service-approved conservation bank, for creation credits that are equivalent of 0.61 acre of suitable vernal pool habitat for this species.

To:

As described in the April 15, 2005, letter from FHWA to the Service, the California Department of Transportation will reserve \$216,300.00 (2.06 acres x \$105,000.00/acre) in the Pigeon Pass Project account to be used for in-lieu payments for 2.06 acres of vernal pool fairy shrimp habitat. The funds shall be released by Caltrans upon written instruction from the Sacramento Fish and Wildlife Office.

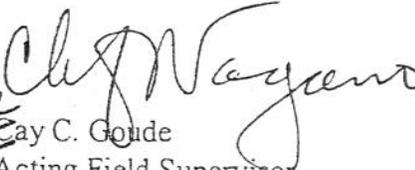
The remainder of the February 28, 2005, biological and conference opinion are unchanged. This concludes formal consultation on the Pigeon Pass Curve Realignment Project in Alameda County, California. As provided in 50 CFR § 402.16, re-initiation of formal consultation is required where discretionary 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, any operations causing such take must cease pending re-initiation.

Mr. Gene Fong

4

If you have any questions regarding this amendment to the biological opinion on the Pigeon Pass Curve Realignment Project, please contact Chris Nagano, Chief of our Endangered Species Division, at the letterhead address or at (916) 414-6648.

Sincerely,


For
Cay C. Goude
Acting Field Supervisor

cc:

Larry Vinzant, Federal Highway Administration, Sacramento, California
Jeannie Baker, Christel Little, Shanna Zahner, California Department of Transportation,
Marysville, California
Chris Collison, California Department of Transportation, Sacramento, California
Susan Chang, Jeff Jensen, California Department of Transportation, Oakland, California
Larry Eng, California Department of Fish and Game, Rancho Cordova, California
Dee Warenycia, California Department of Fish and Game, Sacramento, California
Janice Gan, Carl Wilcox, Scott Wilson, Warden Nicole Kozicki, California Department of Fish
and Game, Yountville, California
Scott Heard, Law Enforcement, FWS, Sacramento, California



United States Department of the Interior



FISH AND WILDLIFE SERVICE

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

In Reply Refer To
1-1-07-F-0268

July 20, 2007

Mr. Gene Fong
Federal Highway Administration
Department of Transportation
650 Capital Mall, Suite 4-100
Sacramento, California 95814

Subject: Amendment to the Biological Opinion on the Proposed Pigeon Pass Curve
Realignment, Southwest of Livermore, Alameda County, California (1-1-04-F-
0115)

Dear Mr. Fong:

This is an amendment to the biological opinion on the Pigeon Pass Curve Realignment, southwest of the City of Livermore, Alameda County, California. At issue are the adverse effects on the threatened California tiger salamander (*Ambystoma californiense*) and the threatened California red-legged frog (*Rana aurora draytonii*). The Service issued the biological opinion (1-1-04-F-1115) for this Federal action on February 28, 2005. This document is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 *et seq.*)(Act).

On June 27, 2007, the Service visited the Pigeon Pass project site per Term and Condition B.1. of the February 28, 2005, biological opinion. We met with the project engineer and the biological monitor. It was our conclusion that construction-related Conservation Measures and Terms and Conditions are being implemented at the project.

This amended biological opinion is based on: (1) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment, Southwest of Livermore, Alameda County, California*, dated February 13, 2005, that was prepared by the U.S. Fish and Wildlife Service (Service); (2) a telephone discussion between the Service and the California Department of Transportation on July 20, 2007; (3) the June 27, 2007, site visit to the project by the Service; (4) several electronic mail messages between the Service and the California Department of Transportation during the month of July 2007.

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1. The following additions are made to the Conservation Measures on page 6 of the February 28, 2005, biological opinion:

14. All California red-legged frogs and California tiger salamanders encountered in the action area will be relocated to a Service-approved location to the maximum extent possible. The written authorization of the Service shall be obtained by the California Department of Transportation prior to transporting California tiger salamanders and/or California red-legged frogs to a location other than the approved translocation site (i.e., individuals of either of these two listed animals shall not be moved to laboratories, holding facilities, or other facilities without the written authorization of the Service).

15. The Service-approved biologist(s) will use nets or their bare hands to capture California red-legged frogs and California tiger salamanders at the project site. The Service-approved biologist(s) will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two (2) hours before and during periods when they are capturing and relocating either of these two listed species

2. The following addition is made to the Amount or Extent of Take on page 62 second paragraph of the February 28, 2005, biological opinion:

Change:

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. **Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.**

To:

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur

on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. **Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, pursue, capture, collect, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.**

3. The following addition is made to the Amount or Extent of Take on page 62 third paragraph of the February 28, 2005, biological opinion:

Change:

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. **Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.**

To:

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. **Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, pursue, capture, collect, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.**

4. The following addition is made to the terms and Conditions on page 71 of the February 28, 2005, biological opinion:

26. There shall be an adequate number of Service-approved biologists to monitor the effects of the project on the San Joaquin kit fox, California tiger salamander, and/or California red-legged frog. The number of Service-approved biologists who are on-site shall be determined by the Service, California Department of Fish and Game, and/or the California Department of Transportation biologist.

5. The following addition is made to the terms and Conditions on page 71 of the February 28, 2005, biological opinion:

27. Excavation of ground squirrel and rodent burrows to salvage California tiger salamanders and California red-legged frog shall be done with hand tools whenever possible. The depth to which these two amphibians are found depend on the burrow-specific conditions. Excavation should extend into the moist areas of the burrows that can sustain these amphibians through the dry summer months. The depth at which these animals are found should be recorded whenever possible and the information should be provided to the Service and the California Department of Fish and Game.

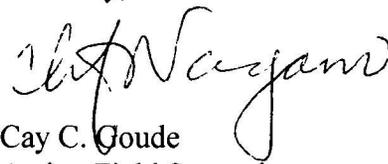
a. Upon capture, individual California tiger salamanders and California red-legged frogs should be placed in a clear plastic container (ie., Tupperware®) of suitable size (e.g. enough room so the animal is not unnecessarily inhibited in its movements). The container should be kept moist with damp paper towels, ¼ inch or ½ inch soft foam rubber, or natural or plastic sponges. The lids of the containers should have small air holes for ventilation. If possible, only one frog or salamander should be placed in each plastic container. More than one animal can be placed in a shoe box-sized or larger container, however, the two listed species shall not be mixed in order to avoid injury due to jumping by the frogs. Individuals should never be so crowded that they are touching another individual. Crowding can cause stress reactions and even death. California tiger salamanders secrete a milky or bubbling substance when stressed. The secretion is often accompanied by body arching and outstretched limbs when stress has reached lethal levels.

- b. Individual plastic containers containing salamanders or frogs should be held in an ice chest. Ice packs should be placed on top of the containers to maintain a cool temperature comparable to a refrigerator. The ice chests shall be kept in a cool, dark, quiet secure room
- c. California tiger salamanders and California red-legged frogs should be released as soon as possible but can be held in this manner for 2 to 3 days prior to release.
- d. California tiger salamanders and California red-legged frogs shall be released at the mouth of a ground squirrel or other rodent burrow of suitable size. If burrow density allows, only one animal should be released per burrow. A maximum of three California tiger salamanders or California red-legged frogs may be placed in extensive burrows. The ground squirrel burrows or other rodent burrows must be currently used by the appropriate rodent species and the burrows must have moist and cool conditions to support salamanders. Frogs and salamanders can be encouraged to enter the burrows by gently nudging if they do not enter on their own. Individuals or the two listed species should be released one at a time rather than en masse.

The remainder of the February 28, 2005, biological opinion is unchanged. This concludes formal consultation on the Pigeon Pass Curve Realignment, southwest of the City of Livermore, Alameda County, California. 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 Federal Highway Administration 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, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this amendment to the biological opinion for the biological opinion and conference opinion on the Pigeon Pass Curve Realignment, southwest of the City of Livermore, Alameda County, California, please contact Chris Nagano or John Cleckler at the letterhead address or at 916/414-6600.

Sincerely,


Cay C. Goude
Acting Field Supervisor

Mr. Gene Fong

6

cc:

Todd Ellwood, CH2M Hill, Oakland, California

Craig Lawrence, CH2M Hill, Oakland, California

Dan Weinberg, CH2M Hill, Oakland, California

Scott Wilson, California Department of Fish and Game, Yountville, California

Janice Gan, California Department of Fish and Game, Yountville, California

Eric Brown, Livermore Community Development Department, Livermore, California

Bill Gray, Gray and Bowen, Walnut Creek, California

Jean Hart, Alameda County Congestion Management Agency, Oakland, California



United States Department of the Interior

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



In reply refer to:
81420-2008-F-0214

NOV 5 2007

Mr. James B. Richards
Attn: Margaret Gabil
California Department of Transportation
111 Grand Avenue
P.O. Box 23660
Oakland, California 94623-0660

Subject: Amendment to the Biological Opinion for the Effects of the State Route 84 Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 1-1-04-F-0115) on the Endangered San Joaquin Kit Fox, the Threatened California Red-Legged Frog, the Threatened California Tiger Salamander, and Vernal Pool Fairy Shrimp for the Inclusion of the Proposed Sweet Ranch Mitigation Site

Dear Mr. Richards:

This document amends the U. S. Fish and Wildlife Service's (Service) February 28, 2005, *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment, Southwest of Livermore, Alameda County, California (Service File Number: 1-1-04-F-0115)* for the effects of roadway improvement project located on State Route 84 on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), the threatened California red-legged frog (*Rana aurora draytonii*), the threatened California tiger salamander (*Ambystoma californiense*), and the threatened vernal pool fairy shrimp (*Branchinecta lynchi*) to included the proposed enhancement activities at the proposed Sweet Ranch mitigation site. Your request was received in our office on October 12, 2007. This amendment is in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act). The biological opinion was previously amended on April 21, 2005 (Service File: 1-1-04-F-0116) and again on May 2, 2007 (Service File: 1-1-07-F-0159).

The applicant wishes to amend the project description described in the biological opinion to include the habitat creation and enhancement activities at the proposed Sweet Ranch mitigation site. Caltrans proposes to use the proposed Sweet Ranch mitigation site as compensation for adverse effects to the San Joaquin kit fox, California red-legged frog, and California tiger salamander resulting from the and Pigeon Pass Curve Realignment Project. Therefore, the Sweet Ranch activities are considered as a component of the Pigeon Pass Curve Realignment Project. The Sweet Ranch will be considered for compensation by the Service when Caltrans has satisfied

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the requirements for a conservation easement, management plan, endowment, and presence of the target species within the proposed mitigation area.

This amended biological opinion is based on: (1) the *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment, Southwest of Livermore, Alameda County, California* (Service File Number: 1-1-04-F-0115) dated February 28, 2005, that was prepared by the U. S. Fish and Wildlife Service's (Service); (2) the *Amendment to Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-04-F-0116), dated April 21, 2005, that was prepared by the Service; (3) the *Amendment to the Formal Section 7 Consultation for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File: 1-1-07-F-0159), dated May 2, 2007, that was prepared by the Service; (3) a letter from the California Department of Transportation (Caltrans) dated October 12, 2007, and received on October 12, 2007, requesting an amendment to the biological opinion; (4) the *Initial Habitat Assessment for the Sweet Ranch Mitigation Area in Alameda County, CA* dated May 4, 2006 and received by the Service on May 8 2006; (5) additional project description information provided via electronic mail message by USDA Natural Resources Conservation Service on October 10, 2007, and by Caltrans on October 24, 2007; and (6) other information available to the Service.

The following changes are made to the February 28, 2005, biological opinion:

1. Add to the Consultation History:

- | | |
|------------------|--|
| May 1, 2006 | The Service visited the proposed Sweet Ranch site. |
| May 8, 2006 | The Service received the <i>Initial Habitat Assessment for the Sweet Ranch Mitigation Area in Alameda County, California</i> . |
| October 10, 2007 | The USDA Natural Resources Conservation Service provided the project description for the proposed Sweet Ranch mitigation site habitat restoration, creation, and enhancement activities via an electronic mail message on behalf of Caltrans. |
| October 12, 2007 | The Service received a request for an amendment to the biological opinion to include activities associated with the proposed Sweet Ranch mitigation site habitat restoration, creation, and enhancement activities via an electronic mail message on behalf of Caltrans. |
| October 24, 2007 | Caltrans provided additional project description information for the proposed Sweet Ranch mitigation site habitat restoration, creation, and enhancement activities via an electronic mail message on behalf of Caltrans. |

2. Add the following to the Description of the Proposed Action:

Sweet Ranch Conservation Site Habitat Restoration, Creation, and Enhancement

Caltrans proposes to use 97.7 acres of the approximately 100 acre Sweet Ranch property off of Patterson Pass Road as a conservation site to compensate for adverse effects to the San Joaquin kit fox, California red-legged frog, and California tiger salamander resulting from Caltrans' projects in Alameda County, including the Pigeon Pass Curve Realignment Project. The Sweet Ranch will be considered for compensation by the Service when Caltrans has satisfied the requirements for an acceptable conservation easement, management plan, endowment, and presence of the target species within the proposed conservation area. Caltrans proposes to implement habitat restoration and creation activities within 97.7 acres of the Sweet Ranch site to enhance its value for the California red-legged frog and California tiger salamander.

The proposed Sweet Ranch site is located approximately 6 miles east of downtown Livermore and 2 miles east of the University of California's Lawrence Livermore Laboratory, in the Altamont Hills region of eastern Alameda County. The site is bordered by Patterson Pass Road to the north and Cross Road to the west. The southern and eastern portions of the proposed mitigation site are bordered by private property primarily used for grazing.

The Sweet Ranch site historically was used for dry-land farming of grains and is now occupied by rolling grassland used for cattle grazing. An approximately 1 linear mile intermittent creek runs east to west and parallel to Patterson Pass Road along the northern border of the mitigation site. The riparian cover along the creek is patchy and includes willow (*salix* species), northern California black walnut (*Juglans californica* var. *hindsii*), blue elderberry (*Sambucus Mexicana*), poison oak (*Toxicodendron diversilobium*), *Eucalyptus* species, and Himalayan blackberry (*Rubus discolor*). The site also has two existing seeps and associated wetlands located along the southern edge of the creek. Caltrans refers to these two seeps as Seep East and Seep West. There is a residence on the ranch that includes a house, barn, and garage. Pacific Gas & Electric (PG&E) maintain a utility easement through the ranch site for an overhead transmission line. The area occupied by the structures and utility easement is not included in the proposed mitigation area.

General Scope of Work

The key elements of the proposed Sweet Ranch conservation site habitat restoration, enhancement, and creation activities will be completed in two phases. The activities associated with the first phase are summarized as follows:

1. Excavation of a shallow seep wetland to create a deeper water wetland/pond suitable for breeding by the California tiger salamander and the California red-legged frog.
2. Eucalyptus tree removal.

The activities included in the second phase are not included in this amendment but will be included in a future request for an amendment to the biological assessment and are summarized as follows:

1. Creation of additional seasonal wetlands in the upland Bowl Area and the Wet Meadow/Meandering Channel Wetland Creation Area.
2. Stream restoration/wet meadow creation in the lowest stream reach near the intersection of Patterson Pass and Cross Roads.
3. Restoration and enhancement of the upper reaches within the existing riparian corridor (debris removal and exotic species removal and control).
4. Boulder weir installation at along the creek to slow head-cutting and potentially expand existing in-stream wetlands.
5. Riparian planting in the lower reaches, where little riparian vegetation exists.
6. Removal and replacement of one large culvert (at the existing driveway).
7. Culvert extension and gully repair at improperly outletted existing culvert along Patterson Pass Road.
8. Construction of approximately 1-mile of boundary and pasture fencing (5-strand barbed wire) to exclude grazing of created wetlands, springs and new plantings.
9. Reconstruction of the one access road to create a finished grade with a 2 % outslope and armour the surface with drain rock to a finished compacted thickness of 6" to reduce erosion and allow vehicle access for monitoring and making repairs in wet weather.

10. Installation of one corral from portable fencing panels and a chute for working livestock.
11. Reconstruction of two high capacity springs and outfencing.
12. Establishing a domestic water supply well on the caretaker residence parcel (outside of the easement) and modifying the current water supply system to service only the wetlands and riparian plantings.

Construction Activities

Western Seep/Spring Pond Creation Area

Activity at this location will include the creation of a pond/wetland that will be fed by an existing seep to create breeding habitat for the California tiger salamander and the California red-legged frog. The existing seep/spring in this area drains through a slightly depressed wetland area towards a bare ground area that is currently occupied by livestock watering troughs. The area around the troughs is heavily impacted by cattle. According to the property owner, this seep/spring is perennial and was once used to supply water to the residence on-site. Caltrans plans to excavate a deep-water pond below Seep West, in an area of bare ground lying south of the Bowl Area creation site. The seep wetland disappears in this area with the water infiltrating below the surface towards the creek. Caltrans' goal is to bring that water to the surface through excavation, allowing flow through to the creek. The maximum pond depth will be three feet, the footprint will be less than 4,000 square feet (0.09 acres), and the net amount of excavated soil will be approximately 200 cubic yards. The pond will be over-excavated approximately one foot and clayey soil re-compacted to form a dense liner. The excavated soil will be stockpiled for use during phase 2 activities at a location away from the creek and outside the path of any surface water flow. The pond creation will not include the construction of a dam, therefore the water should not concentrate in any particular area if the pond overflows. The area where the pond will be constructed is almost flat and there is no existing evidence of concentrated flow. Downhill from the pond there is a grassed path by which surface water drains to the creek; the pond will be graded so that the overflow pattern is not altered, and any overflow would be expected to continue down the grassed swale to the creek. This pond creation would also include a wetland fringe and, potentially, riparian plantings. In phase 1, the western seep/spring would be out-fenced with permanent fencing to exclude livestock. The newly created pond will be out-fenced with permanent fencing in phase 2.

Equipment used would include a bulldozer and/or a small excavator. Work will take place in the timeframe of October 22 to November 1, 2007. The work will take approximately 1 to 2 days to complete. After excavation, a five-foot-wide fringe around the pond will be seeded with a mixture of mugwort (*Artemisia douglasiana*), meadow barley (*Hordeum brachyantherum*), creeping wildrye (*Leymus triticoides*), and blue-eyed

grass (*Sisyrinchium bellum*). Plugs of appropriate wetland species may be planted in the Fall/Winter 2008 to create transitional vegetation around the pond.

Eucalyptus Tree Removal

Caltrans plans to remove four mature Eucalyptus trees from the eastern section of the riparian corridor on the Sweet Ranch site. The Eucalyptus trees will be removed with a crane or excavator, working from either Patterson Pass Road or the Sweet Ranch side of the creek. The trees will be cut, removed, and the stumps directly treated with glyphosphate. Work will take place in the timeframe of October 22 to November 1, 2007. The work will take approximately 1 to 2 days. If necessary, on-going maintenance may include follow-up glyphosphate treatments to the stumps. Replanting with appropriate native trees will occur during Fall 2008 and will be included in a subsequent amendment to the Pigeon Pass Biological Opinion.

Permanent vs. Temporary Effects

For the Sweet Ranch activities, Caltrans describes the permanent effects on listed species habitat as those areas where the character and function is changed or enhanced as a result of the proposed activities. As a result of the proposed activities, habitat characters and values will change but there will be no loss of listed species habitat. These are areas that might be subject to vegetation removal and extensive soil disturbance due to excavation, grading or placement of dirt fill, or to lesser degrees of disturbance due to creation of temporary access roads, use of staging areas with storage of construction materials and parking heavy equipment. Areas subject to temporary disturbance will be restored so that they once again support vegetation and provide wildlife habitat.

Construction Site Restoration

Caltrans plans to restore areas of temporary ground disturbances, including storage and staging areas, and temporary roads. These areas will be re-contoured, if appropriate, and revegetated with seeds and/or cuttings of appropriate plant species to promote restoration of the area to pre-project conditions. Caltrans will be developing a restoration plan that will be submitted to the Service for approval prior to initial ground breaking. According to Caltrans, to the maximum extent practicable (i.e., presence of natural lands), topsoil will be removed, cached, and returned to the site according to successful restoration protocols. Loss of soil from run-off or erosion will be prevented with straw bales, straw wattles, or similar means provided they do not entangle, block escape or dispersal routes of listed animal species.

Proposed Conservation Measures

Caltrans proposes to avoid and minimize effects to listed species during the Sweet Ranch activities by implementing the measures prescribed for the Pigeon Pass Curve Realignment project and included in the original biological opinion.

Maintenance and Monitoring

Maintenance and monitoring of the Sweet Ranch Conservation Site will be performed by the Alameda County Resource Conservation District. Maintenance activities are expected to include repeat hand removal or herbicide treatment of Eucalyptus, fence maintenance, watering of plantings, and removal of any exotic plant species that may invade the pond. Monitoring will include qualitative and quantitative measures of plant establishment and invasive species reduction, pond water level assessment, and surveys in the pond and surrounding grassland for the California tiger salamander and California red-legged frog.

Reporting

Reporting will be done by the Alameda County Resource Conservation District. Construction and monitoring activities will be documented and monitoring reports will be forwarded to the Service annually for up to 5 years. The first monitoring report will be due no later than December 31st, one year after completion of phase 1, and annually every December 31st for each consecutive monitoring season. An annual report describing construction activities and maintenance and monitoring operations will be submitted to the Service for up to 5 years.

3. Change the first paragraph on page 23 under the Status and Environmental Baseline section for the San Joaquin kit fox from:

Suitable kit fox habitat in the form of grasslands is abundant in the action area, and contiguous within a 10-mile radius of the project (California Department of Transportation 2002). There is an abundance of grassland habitat and ground squirrels, which provide dens and a prey base (Nagano pers. obs. November 2004; California Department of Transportation 2004). According to the California Department of Transportation (2004), signs of smaller rodents were also noted at the entrances of dens; they also reported other prey species of the San Joaquin kit fox in the form of the western fence lizards (*Sceloporus occidentalis*), black-tailed jack rabbits, and snakes. Several squirrel dens appeared to be enlarged by another animal (California Department of Transportation 2004). The San Joaquin kit fox has been documented to enlarge and utilize ground squirrel burrows. In addition, individuals of this species have been recorded to move as far as 9 miles or more in a single night (U.S. Fish and Wildlife Service 1998). The closest kit fox sighting to the proposed project is approximately 5 miles from the project site. There are no obvious natural barriers that would prevent kit fox movement within a 10-mile radius. Therefore, the Service believes that the San Joaquin kit fox is reasonably certain to occur within the action area because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the project, as well as the nearby observations of this listed species.

TO:

Suitable kit fox habitat in the form of grasslands is abundant in the action areas for the road project and Sweet Ranch enhancement project, and contiguous within a 10-mile

radius of the projects (California Department of Transportation 2002). There is an abundance of grassland habitat and ground squirrels, which provide dens and a prey base (Nagano pers. obs. November 2004; California Department of Transportation 2004). According to the California Department of Transportation (2004), signs of smaller rodents were also noted at the entrances of dens; they also reported other prey species of the San Joaquin kit fox in the form of the western fence lizards (*Sceloporus occidentalis*), black-tailed jack rabbits, and snakes. Several squirrel dens appeared to be enlarged by another animal (California Department of Transportation 2004). The San Joaquin kit fox has been documented to enlarge and utilize ground squirrel burrows. In addition, individuals of this species have been recorded to move as far as 9 miles or more in a single night (U.S. Fish and Wildlife Service 1998). The closest documented kit fox sighting is approximately 5 miles from the road project site and 1 mile from the Sweet Ranch project site. There are no obvious natural barriers that would prevent kit fox movement within a 10-mile radius from either project location. Therefore, the Service believes that the San Joaquin kit fox is reasonably certain to occur within the action area of the road project and Sweet Ranch because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the projects, as well as the nearby observations of this listed species.

4. Add the following after the last paragraph under the Status and Environmental Baseline section for the California tiger salamander on page 29:

The proposed Sweet Ranch mitigation site is primarily characterized by rolling annual grassland habitat actively grazed by cattle. The site includes numerous active ground squirrel and other small mammal burrows appropriate for tiger salamander occupation. The Sweet Ranch is private property surrounded by extensive and contiguous rangeland with little disturbance or development.

The California Natural Diversity Database includes a California tiger salamander record approximately 1 mile west of the proposed Sweet Ranch mitigation site and a second breeding pond occupied by the species approximately 1,000 feet from the northern boundary of the proposed mitigation site. Although there are currently no potential breeding ponds on the proposed mitigation site, the site does provide likely upland habitat for California tiger salamanders and creation of a suitable and sustainable breeding pond on the site would likely enhance the local habitat value. The Service has determined it is reasonable to conclude the California tiger salamander inhabits the Sweet Ranch project area, based on the biology and ecology of the species, the presence of suitable habitat, as well as nearby observations of this animal.

5. Change the last paragraph under the Status and Environmental Baseline section for the California red-legged frog on page 35 from:

There are several recent sightings of the California red-legged frog in the action area and throughout the region south of Livermore (California Department of Fish and Game 2004; California Department of Transportation 2004). Surveys for the vernal pool fairy

shrimp conducted by California Department of Transportation in the Pigeon Pass Project action area detected California red-legged frog egg masses (California Department of Transportation 2004). Habitat of this listed species occurs along the entire Pigeon Pass Project corridor, and includes several drainage crossings. Adult California red-legged frogs are highly mobile and may move considerable distances from their breeding ponds. Areas containing aquatic and upland habitat exist within and adjacent to the action area (Nagano pers. obs. November 2004). The action area contains components that can be used by the California red-legged frog for feeding, resting, mating, movement corridors, and other essential behaviors. Therefore, the Service believes that the California red-legged frog is reasonably certain to occur within the action area because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the action area, as well as the recent observations of this listed species.

TO:

There are several recent sightings of the California red-legged frog in the action area for the road project and throughout the region south of Livermore (California Department of Fish and Game 2004; California Department of Transportation 2004). Surveys for the vernal pool fairy shrimp conducted by California Department of Transportation in the Pigeon Pass Project action area detected California red-legged frog egg masses (California Department of Transportation 2004). Habitat of this listed species occurs along the entire Pigeon Pass Project corridor, and includes several drainage crossings. Adult California red-legged frogs are highly mobile and may move considerable distances from their breeding ponds.

The proposed Sweet Ranch includes California red-legged frog habitat in the unnamed intermittent creek dominated by dense riparian vegetation and along the lower terraces. The riparian habitat and surrounding grasslands offer dispersal, foraging, and aestivation habitat. The frog species has been recorded less than 1 mile away from the Sweet Ranch project area and a likely breeding pond supporting the California tiger salamander occurs within 1,000 feet of the north boundary of the property.

Areas containing aquatic and upland habitat exist within and adjacent to the action area for both projects (Nagano pers. obs. November 2004; Cleckler pers. obs. May 2006). The action area for both projects contain components that can be used by the California red-legged frog for feeding, resting, mating, movement corridors, and other essential behaviors. Therefore, the Service believes that the California red-legged frog is reasonably certain to occur within the action area for the road project and the Sweet Ranch project because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the action area, as well as the recent observations of this listed species.

6. Change the second paragraph under the Effects of the Proposed Action section from:

Temporary effects are project activities that temporarily remove one or more essential components of the habitat of a listed species, but can be restored to pre-project conditions of equal or greater habitat value. In order for the effects to be considered temporary, the affected habitat of the listed species must be totally restored within two seasons. Ground disturbance resulting from the proposed Pigeon Pass Project includes substantial grading, excavating, and fill. The California Department of Transportation is considering the adverse effects of a significant amount of cut and fill of earth, a maximum of approximately 68 acres, to be of a temporary nature. This cut and fill has potential to cause injury and mortality to individual San Joaquin kit foxes, California tiger salamanders, and the California red-legged frogs occupying the action area, and these areas likely will not be suitable for use as habitat for foraging, breeding, resting and other essential behaviors by these three animals for a significant period of time, almost certainly longer than two seasons after the construction of the project is completed.. As part of the project description, the California Department of Transportation has stated upon completion of the project, they will re-contoured temporally affected habitat areas if necessary, and revegetate them to promote restoration of the area to pre-project conditions. The temporary effects will result in the permanent loss of the habitat utilized by these three listed animal species unless the restoration implemented the California Department of Transportation is adequately planned, utilizes native California plant species collected in the immediate area of the proposed project, and meets specific success criteria.

TO:

Temporary effects are project activities that temporarily remove one or more essential components of the habitat of a listed species, but can be restored to pre-project conditions of equal or greater habitat value. In order for the effects to be considered temporary, the affected habitat of the listed species must be totally restored within one year of initial disturbance. Ground disturbance resulting from the proposed Pigeon Pass Road Construction Project includes substantial grading, excavating, and fill. Ground disturbance resulting from the proposed phase 1 habitat enhancement activities at the Sweet Ranch property includes equipment access, excavation, and fill stockpiling.

For the road construction project, the California Department of Transportation is considering the adverse effects of a significant amount of cut and fill of earth, a maximum of approximately 68 acres, to be of a temporary nature. This cut and fill has potential to cause injury and mortality to individual San Joaquin kit foxes, California tiger salamanders, and the California red-legged frogs occupying the action area, and these areas likely will not be suitable for use as habitat for foraging, breeding, resting and other essential behaviors by these three animals for a significant period of time, almost certainly longer than one year after the initial ground disturbance. As part of the project description, the California Department of Transportation has stated upon completion of the project, they will re-contoured temporally affected habitat areas if necessary, and

revegetate them to promote restoration of the area to pre-project conditions. The temporary effects will result in the permanent loss of the habitat utilized by these three listed animal species unless the restoration implemented the California Department of Transportation is adequately planned, utilizes native California plant species collected in the immediate area of the proposed project, and meets specific success criteria.

Phase 1 activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland.

7. Change the first paragraph under the San Joaquin kit fox section of the Effects of the Proposed Action section on page 45 from:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species

TO:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed road project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species. The proposed phase 1 activities at the Sweet Ranch property would result in the conversion of 0.09 acres of upland habitat for the San Joaquin kit fox to additional wetland habitat and result in possible construction-related harassment of an unknown number of San Joaquin kit foxes.

8. Change the first paragraph under the California tiger salamander section of the Effects of the Proposed Action section on page 54 from:

The proposed Pigeon Pass Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities.

Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to dessication, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as racoons, crows, and ravens, to the sites, who could subsequently prey on the listed amphibian. Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or dessication (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander.

TO:

The proposed Pigeon Pass Road Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed road project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to dessication, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as racoons, crows, and ravens, to the sites, who could subsequently prey on the listed amphibian. Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or dessication (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed road project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander.

Phase 1 activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland intended to provide breeding habitat for the California tiger salamander. Activities may result in construction related harassment and the death of an unknown number of California tiger salamanders.

9. Change the first paragraph under the California red-legged frog section of the Effects of the Proposed Action section on page 57 from:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County.

TO:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed road project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County.

Phase 1 activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland intended to provide breeding habitat for the California red-legged frog. Activities may result in construction related harassment and the death of an unknown number of red-legged frogs.

10. Change the first paragraph under the vernal pool fairy shrimp section of the Effects of the Proposed Action section on page 59 from:

Vernal pool fairy shrimp may be directly injured, killed, harmed, and harassed by activities that damage their vernal pool habitat. The proposed project would directly eliminate 0.84 acre of vernal pools that provides habitat for this species, and fragment and reduce the acreage of the remaining for this listed crustacean habitat located in Alameda County.

TO:

Vernal pool fairy shrimp may be directly injured, killed, harmed, and harassed by activities that damage their vernal pool habitat. The proposed road project would directly

eliminate 0.84 acre of vernal pools that provides habitat for this species, and fragment and reduce the acreage of the remaining for this listed crustacean habitat located in Alameda County. The proposed phase 1 activities at the Sweet Ranch property are not expected to adversely affect the vernal pool fairy shrimp.

11. Change the Amount or Extent of Take section beginning on page 62 from:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, the animal may range over a large territory, it is primarily active at night, it is a highly intelligent animal that is often extremely shy around humans, and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17. acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is

unlikely because of their relatively small body size. Losses of this 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 is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to located in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment and based on the November 8, 2004, site visit, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

TO:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, the animal may range over a large territory, it is primarily active at night, it is a highly intelligent animal that is often is extremely shy around humans, and the finding of an injured or dead individual is unlikely because of their relatively small body size, Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17. acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. In addition, all San Joaquin kit foxes inhabiting the proposed 97.7 acre Sweet Ranch mitigation site will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including phase 1 activities at the Sweet Ranch property, in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. In addition, all California tiger salamanders inhabiting the proposed 97.7 acre Sweet Ranch mitigation site will be subject to incidental take during the enhancement activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including phase 1 activities at the Sweet Ranch property, in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. In addition, all California red-legged frogs inhabiting the proposed 97.7 acre Sweet Ranch mitigation site will be subject to incidental take during the enhancement activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including phase 1 activities at the Sweet Ranch property, in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

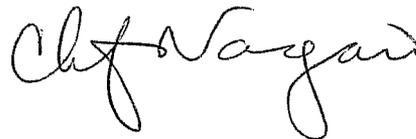
The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or napulai are difficult to located in the vernal pools and seasonal wetlands; and the finding

of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment for the road project and based on the November 8, 2004, site visit, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

This concludes the reinitiation of the formal consultation on the Pigeon Pass Curve Realignment 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.

If you have any questions regarding this amendment to the biological opinion for the Pigeon Pass Curve Realignment Project, please contact John Cleckler, Ryan Olah, or Chris Nagano of my staff at (916) 414-6625.

Sincerely,



Cay C. Goude
Acting Field Supervisor

cc:

Jeff Jensen, California Department of Transportation, Oakland, California
Margaret Gabil, California Department of Transportation, Oakland, California
Cheryl Davis, California Department of Transportation, Oakland, California
Larry Eng, California Department of Fish and Game, Rancho Cordova, California
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Dan Gifford, California Department of Fish and Game, Lodi, California

Janice Gan, California Department of Fish and Game, Yountville, California
Carl Wilcox, California Department of Fish and Game, Yountville, California
Scott Wilson, California Department of Fish and Game, Yountville, California
Warden Nicole Kozicki, California Department of Fish and Game, Yountville, California



United States Department of the Interior

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



IN REPLY REFER TO:
81420-2008-F-0214-2

APR 17 2008

Mr. Jim Richards
Attn: Alison Graff
Office of Biological Sciences and Permits
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Subject: Amendment to Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County, California (Service File No. 1-1-04-F-0115) for the Inclusion of the Installation of an Underground AT&T Phone Line to the Mullenex Residence at 2980 Vallecitos Road, Livermore, California.

Dear Mr. Richards:

This letter is an amendment to the Biological Opinion and Conference Opinion issued for the Pigeon Pass Curve Realignment Project located in Alameda County, California. At issue are the effects of the project on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), threatened California red-legged frog (*Rana aurora draytonii*), threatened California tiger salamander (*Ambystoma californiense*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*), and proposed critical habitats for the California red-legged frog and the California tiger salamander. This amended biological and conference opinion is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. §1531 *et seq.*).

This amended biological and conference opinion is based on: (1) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment Project, Southwest of Livermore, Alameda County, California* (1-1-04-F-0115) dated February 28, 2005 prepared by the U.S. Fish and Wildlife Service (Service); (2) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-04-F-0116) dated April 21, 2005; (3) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-07-F-0268) dated July 20, 2007; (4) a request for an amendment to the Biological Opinion and Conference Opinion from the California Department of Transportation, dated April 1, 2008; (5) correspondence between Alison Graff (Caltrans), Margaret Gabil (Caltrans), Derek Jansen (URS Corporation), and Jerry Roe (Service) between March 27, 2008 and April 16, 2008 concerning the installation of 6,593 feet of underground phone line to restore phone service to the Mullenex residence located at 2980 Vallecitos Road; and (6) other information available to the Service.

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The following changes are made to the February 28, 2005 Biological Opinion and Conference Opinion:

1. Add the following to the **Consultation History**:

- | | |
|-------------------------------------|--|
| March 27, 2008 to
April 16, 2008 | Email correspondence between the Service and Caltrans discussing restoration of phone service to Mullenex, residence. |
| April 4, 2008 | Jerry Roe (Service) visited the proposed project site with biological monitor Derek Jansen (URS Corporation) to evaluate the action area and determine the extent of impacts to listed species and critical habitat. |

2. Add the following to the **Description of Proposed Action**:

Installation of an Underground Phone Line to a Single-Family Residence Located at 2980 Vallecitos Road, Livermore, California

General Scope of Work

During construction at the Pigeon Pass Curve Realignment Project in 2007, Caltrans inadvertently disrupted phone service to the Tiffin Mullenex residence located at 2980 Vallecitos Road, Livermore, California. Caltrans proposes to reconnect phone service by installing a new underground phone line to the residence. The phone line will be constructed from station 79+40 southwest to the Mullenex driveway and will run along the west side of State Route 84 (SR 84). It will pass under SR 84 and the new alignment currently under construction, and will continue along the northern side of the driveway to the residence.

Construction Activities

Approximately 6,593 feet of 2-inch c-pc (Schedule 40) conduit and fifteen 30 x 48 x 34 inch pull boxes with traffic covers will be installed. The conduit will be placed at the bottom of a trench 24 inches deep and 6 to 12 inches wide, with the midline of the trench placed 30 inches off the edge of pavement. The pull boxes will be placed such that the side furthest from the road will lay 40 inches from the edge of pavement. Where the line crosses the existing SR 84 to the Mullenex property, the conduit will be placed in a trench as previously described, or through a 130-foot bore hole. The trench will be excavated with a trencher or excavator and backfilled with the excavated earth as the phone line is laid down; no part of the trench will be left unfilled during the construction period. After the trench is backfilled, the fill soil will be compacted with a hand-held compactor (jumping jack) or small roller. All work will be performed either by the Contractor for the road project or a subcontractor. Installation of the line is expected to begin in early April 2008 and will take two weeks to complete. Work will be done during the daytime and no work will take place in the rain or when the soil is excessively moist.

A total length of 1,181 feet of trench will be located inside the cut and fill area described in the Biological Opinion and Conference Opinion dated February 28, 2005 for the Pigeon Pass Curve Realignment Project, and 5,412 feet will be located outside of the cut and fill area. Of the 5,412 feet located outside of the cut and fill area, 2,000 feet will be located along the driveway on the Mullenex property and 3,412 feet will be located within the existing SR 84 right-of-way. Three pull boxes will be located inside the cut and fill and 12 will be located outside the cut and fill area on the SR 84 right-of-way and the Mullenex property.

Permanent and Temporary Effects

Installation of the conduit and pull boxes will disturb approximately 6,734 square feet (0.15-acre) of ruderal and grassland habitat. The Contractor will restore all excavated surfaces over the trench to original or better condition. Trenching and conduit installation will account for 6,593 square feet (0.15-acre) of temporary disturbance. The pull boxes will account for 150 square feet (0.003-acre) of permanent disturbance, since they will replace earthen areas with impermeable surfaces. The area of ground disturbance inside and outside of the project cut and fill lines is shown in Table 1.

Table 1. Area of Ground Disturbance from Phone Line Installation.

Type of Affect	Inside Existing Cut and Fill	Outside Existing Cut and Fill	Total
Trench (Temporary Affect)	1,181 ft ² (0.03 ac)	5,412 ft ² (0.12 ac)	6,593 ft ² (0.15 ac)
Pull Boxes (Permanent Affect)	30 ft ² (0.0007 ac)	120 ft ² (0.003 ac)	150 ft ² (0.003 ac)
Total	1,211 ft² (0.03 ac)	5,532 ft² (0.12 ac)	6,743 ft² (0.15 ac)

Where the trench parallels the Mullenex driveway and turns north towards the residence, it will be excavated in ruderal annual grassland that forms the upland associated with the Mullenex pond. This pond currently supports a breeding population of California tiger salamanders (*Ambystoma californiense*). Approximately, 2,000 feet of the trench and four pull boxes will be located within this upland area, resulting in 2,000 feet of temporary impacts and 40 square feet of permanent impacts outside of the project cut and fill. Where the trench parallels SR 84, it will be located on the shoulder or toe of the slope in highly disturbed ruderal habitat. The toe of slope along this stretch of highway is characterized by tire ruts, gravel, trash, areas of steep banks, and non-native invasive plant species. No small mammal burrowing activity was observed. Along the highway shoulder 1,584 feet to be trenched borders the Ruby Hills mitigation area within disturbed ruderal roadside habitat, 180 feet of which lies within the cut and fill for the Pigeon Pass Curve Realignment Project.

Proposed Conservation Measures

There is the potential that animals may be disturbed or harmed during the installation of the phone line. To avoid this possibility, Caltrans will observe all of the avoidance and minimization measures set forth in the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, including the presence of a biological monitor during all excavation and fill activities. Because all trenches will be backfilled immediately following excavation, Caltrans is proposing to work without erecting Environmentally Sensitive Area (ESA) fencing in the areas outside of the cut and fill for the project. If a burrow is encountered during trenching, the monitor will excavate it by hand to determine whether California tiger salamanders are present. If an animal is found, it will be relocated to the Ruby Hills mitigation area, as per the Biological Opinion. Upon completion of the project, the Contractor will restore all excavated surfaces over the trench to original or better condition.

3. The following additions are made to the **Avoidance and Protection Measures -- Listed Species** on page 6:
 14. All California red-legged frogs and California tiger salamanders encountered in the action area will be relocated to Ruby Hills or a Service-approved location. The written authorization of the Service shall be obtained by the California Department of Transportation prior to transporting California tiger salamanders and/or California red-legged frogs to a location other than the approved translocation site (*i.e.*, individuals of either of these two listed animals shall not be moved to laboratories, holding facilities, or other facilities without the written authorization of the Service).
 15. The Service-approved biologist(s) will use nets or their bare hands to capture California red-legged frogs and California tiger salamanders at the project site. The Service-approved biologist(s) will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two (2) hours before and during periods when they are capturing and relocating either of these two listed species.
 16. Prior to trenching, vegetation along the trench line shall be mowed to a width not to exceed 60 inches measured from edge of pavement to facilitate locating burrows, California tiger salamanders, and California red-legged frogs that may be present within the action area. The biological monitor shall perform clearance surveys within the area to be cleared immediately prior to mowing and shall be onsite during all activities that could result in take.
 17. Trenching and installation of conduit and pull boxes shall be constructed in a manner not to exceed the length that can be trenched, conduit installed, and backfilled in a single day. All trenches shall be backfilled by the end of work each day; no trenches shall be left open overnight.
 18. No work shall occur during or following 24 hours of rain events.
 19. The biological monitor shall maintain monitoring records that include: (1) the beginning and ending time of each day's monitoring effort; (2) a statement identifying what species, including general wildlife species, were encountered, including the time and location when such species were found; (3) the time the specimen was identified

and by whom and its condition; and (4) a description of any actions taken. The biological monitor shall maintain complete records in their possession while conducting monitoring activities and shall immediately surrender records to the Service upon request. All monitoring records shall be provided to the Service upon completion of the monitoring work.

20. Following completion of the work, erosion control measures shall be implemented for all disturbed areas, which may include reseeding using a noxious weed free native seed mix, hydroseeding, jute matting, or tackifying agents to stabilize soils, control dust and prevent erosion.

4. The following addition is made to the **Terms and Conditions** on page 71:

26. There shall be an adequate number of Service-approved biologists to monitor the effects of the project on the San Joaquin kit fox, California tiger salamander, and/or California red-legged frog. The number of Service-approved biologists who are on site shall be determined by the Service, California Department of Fish and Game, and/or the California Department of Transportation biologist.
27. Excavation of ground squirrel and rodent burrows to salvage California tiger salamanders and California red-legged frogs shall be done with hand tools whenever possible. The depth to which these two amphibians are found depend on the burrow-specific conditions. Excavation should extend into the moist areas of the burrows that can sustain these amphibians through the dry summer months. The depth at which these animals are found should be recorded whenever possible and the information should be provided to the Service and the California Department of Fish and Game.
 - a. Upon capture, individual California tiger salamanders and California red-legged frogs should be placed in a clear plastic container (*i.e.*, Tupperware® or Rubbermaid®) of suitable size (*e.g.*, enough room so the animal is not unnecessarily inhibited in its movements). The container should be kept moist with damp paper towels, ¼-inch or ½-inch soft foam rubber, or soap-free natural or synthetic sponges. The lids of the containers should have small air holes for ventilation. If possible, only one frog or salamander should be placed in each plastic container. More than one animal can be placed in a shoe box-sized or larger container; however, the two listed species or the same species of significantly different sizes or life history stages shall not be mixed in order to avoid injury or depredation. Individuals should never be so crowded that they are touching one another. Crowding can cause stress reactions and even death. California tiger salamanders secrete a milky or bubbling substance when stressed. The secretion is often accompanied by body arching and outstretched limbs when stress has reached lethal levels.
 - b. Individual plastic containers containing salamanders or frogs should be held in an ice chest. Ice packs should be placed on top of the containers to maintain a cool temperature comparable to a refrigerator. The ice chests shall be kept in a cool, dark, quiet, secure place.

- c. California tiger salamanders and California red-legged frogs should be released as soon as possible, but can be held in this manner for 2 to 3 days prior to release.
- d. California tiger salamanders and California red-legged frogs shall be released at the mouth of a ground squirrel or other rodent burrow of suitable size. If burrow density allows, only one animal should be released per burrow. A maximum of three California tiger salamanders and California red-legged frogs may be placed in extensive burrows. The ground squirrel burrows or other rodent burrows must be currently used by the appropriate rodent species and the burrows must have moist and cool conditions to support salamanders. Frogs and salamanders can be encouraged to enter the burrows by gently nudging if they do not enter on their own. Individuals or the two listed species should be released one at a time rather than en masse.

5. Change the **Conclusions** on page 61 from:

After reviewing the current status of the vernal pool fairy shrimp, California tiger salamander, California red-legged frog, and the San Joaquin kit fox, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the Pigeon Pass Project is not likely to jeopardize the continued existence of these four listed species. Critical habitat for the San Joaquin kit fox has not been proposed or designated, therefore, none will be affected by the proposed project. Critical habitat for the vernal pool fairy has been designated, however none is located in the action area, and therefore none will be affected by the proposed project. Critical habitat has been proposed for the California tiger and the California red-legged frog, however none will be adversely modified or destroyed. The Service reached the conclusion on the effects on the proposed critical habitat of the California red-legged frog and the California tiger salamander because the effects of the project will be offset by the conservation measures in the project description, including the successful restoration of areas subject to the temporary effects of cut and fill to pre-project conditions.

To:

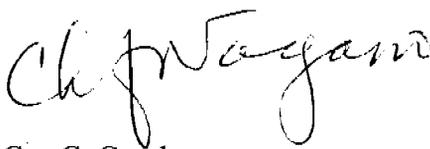
After reviewing the current status of the vernal pool fairy shrimp, California tiger salamander, California red-legged frog, and the San Joaquin kit fox, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the Pigeon Pass Project is not likely to jeopardize the continued existence of these four listed species. Critical habitat for the San Joaquin kit fox has not been proposed or designated, therefore, none will be affected by the proposed project. Critical habitat for the vernal pool fairy has been designated on February 10, 2006 (Federal Register 71: 7117-7167); however none is located in the action area, and therefore none will be affected by the proposed project. On August 23, 2005, the Service issues the final rule for the critical habitat of the Central California population of the California tiger salamander (Federal Register 70: 49379-49458) and critical habitat for the California red-legged frog on April 13, 2006 (Federal Register 71: 19243-19346). Proposed Unit ALA-1C for the California red-legged frog, and Proposed Critical Habitat Unit 4 for the California tiger salamander was not included in the final

critical habitat designations for these two listed species. Therefore, the Pigeon Pass Curve Realignment Project will not result in effects to any proposed or designated critical habitat.

The remainder of the February 28, 2005 Biological Opinion and Conference Opinion is unchanged. This concludes formal consultation on the State Route 84 Pigeon Pass Curve Realignment Project in Alameda County, California. As provided in 50 CFR § 402.16, re-initiation 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, any operations causing such take must cease pending re-initiation.

If you have any questions regarding this amendment to the biological opinion on the State Route 84 Pigeon Pass Curve Realignment Project, please contact Jerry Roe, Endangered Species Biologist, (Jerry_Roe@fws.gov) or (Chris_Nagano@fws.gov) at the letterhead address or at telephone (916) 414-6600 if you have any questions.

Sincerely,


 Cay C. Goude
Acting Field Supervisor

cc:

Margaret Gabil, California Department of Transportation, District 4, Oakland, California
Marcia Grefsrud, California Department of Fish and Game, Yountville, California
Scott Wilson, California Department of Fish and Game, Yountville, California
Liam Davis, California Department of Fish and Game, Yountville, California
Melissa Escaron, California Department of Fish and Game, Yountville, California



United States Department of the Interior

FISH AND WILDLIFE SERVICE

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



IN REPLY REFER TO:
81420-2008-F-0214-3

OCT 29 2008

Mr. Jim Richards
ATTN: Alison Graff
Office of Biological Sciences and Permits
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Subject: Amendment to Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County, California (Service File No. 1-1-04-F-0115) for Compensation Activities at Sycamore Grove Regional Park, Livermore, Alameda County, California.

Dear Mr. Richards:

This is in response to your August 18, 2008, request for reinitiation of formal consultation to amend the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project located in Alameda County, California (Service File No. 1-1-04-F-0115) issued on February 28, 2005. This amendment addresses riparian habitat restoration compensation activities at Sycamore Grove Regional Park located in the City of Livermore, Alameda County, California. This document represents the amended Service's biological opinion on the effects of the action on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), threatened California red-legged frog (*Rana aurora draytonii*), threatened California tiger salamander (*Ambystoma californiense*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), and critical habitats for the California red-legged frog and California tiger salamander. This amended biological opinion is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. §1531 *et seq.*) (Act). The biological opinion was previously amended on April 21, 2005 (1-1-04-F-0116), May 2, 2007 (1-1-07-F-0159), July 20, 2007 (1-1-07-F-0268), November 5, 2007 (81420-2008-F-0214), and April 17, 2008 (81420-2008-F-0214-2).

This amended biological and conference opinion is based on: (1) Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment Project, Southwest of Livermore, Alameda County, California (Service File No. 1-1-04-F-0115) dated February 28, 2005 prepared by the U.S. Fish and Wildlife Service (Service); (2) Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 1-1-04-F-0116) dated April 21, 2005; (3) Amendment to the Biological

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Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 1-1-07-F-0159) dated May 2, 2007; (4) Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 1-1-07-F-0268) dated July 20, 2007; (5) Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County (Service File No. 81420-2008-F-0214) dated November 5, 2007; (6) Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County, California for the Inclusion of the Installation of an Underground AT&T Phone Line to the Mullenex Residence at 2980 Vallecitos Road, Livermore, California (Service File No. 81420-2008-F-0214-2) dated April 17, 2008; (7) a request for an amendment to the Biological Opinion and Conference Opinion from the California Department of Transportation, dated August 18, 2008; (8) Proposal for Riparian Vegetation Establishment at Sycamore Grove "Drainage E" revision dated July 03, 2007; (9) correspondence between Alison Graff (Caltrans), and Jerry Roe (Service) between July 31, 2008 and August 19, 2008; (10) site visit conducted with the Natural Resources Conservation Service, Caltrans, Livermore Area Recreation and Park District (LARPD), and the Service on August 7, 2008; (11) request to include additional conservation measures for Alameda whipsnakes; and (12) other information available to the Service.

The following changes are made to the February 28, 2005 Biological Opinion and Conference Opinion:

1. Add the following to the **Consultation History**:

July 31, 2008 to October 9, 2008	Email correspondence between the Jerry Roe of the Service, and Alison Graff of Caltrans, regarding the proposed compensation activities at Sycamore Grove Regional Park.
August 7, 2008	Jerry Roe of the Service visited the proposed riparian compensation area at Sycamore Grove Regional Park with Jackie Charbonneau of NRCS, Pete Van Hoorn of ACRCDD, Michael Nicholson of LARPD, Alison Graff of Caltrans.
August 18, 2008	The Service received a request from Caltrans to amend the biological opinion via electronic correspondence.
September 3, 2008	The Service received a request from Caltrans to add Conservation Measures for Alameda whipsnake into the Sycamore Grove project description.
September 29, 2008	The Service sent the draft amendment to the biological opinion to Caltrans for review.
October 8, 2008	The Service received comments from Caltrans for the draft amendment to the biological opinion.

2. Add the following to the **Description of Proposed Action**:

Project Summary

The California Department of Transportation (Caltrans) proposes to restore riparian habitat along an unnamed drainage at Sycamore Grove Regional Park as partial compensation for effects to riparian habitat for the Pigeon Pass Curve Realignment Project, pursuant to the requirements of permits from the California Department of Fish and Game (DFG) and the California Regional Water Quality Control Board (RWQCB). Sycamore Grove Regional Park is owned and managed by the Livermore Area Regional Parks District (LARPD). The design and implementation of the proposed compensation activities will be undertaken by the Alameda County Resource Conservation District (ACRCD), in cooperation with the Natural Resources Conservation Service (NRCS).

The area to be planted, Drainage E, consists of 3 acres inside and along a 2,660-foot (ft) grass-lined drainage with ephemeral water flow. Based on the seasonally arid conditions at the site, the ACRCD proposes to revegetate the drainage with a suite of drought tolerant riparian tree and shrub species, primarily valley oaks (*Quercus lobata*) and mulefat (*Baccharis salicifolia*), as well as many species characteristic of a riparian and upland ecotone. The planting plan will consist of both individual design plantings of trees and shrubs and clustered plantings of shrubs and herbaceous species. Long-term, the desired outcome is a naturalistic-looking corridor of valley and coast live oaks, other trees and shrubs, and a persisting and diverse native component in the understory. Work began in February 2008 with the planting of 270 acorns in 90 clusters. A total of approximately 1,400 plants will be installed over the life of the project in hand-dug holes 10 to 18 inches deep and 2 to 4 inches in diameter.

The project will include an irrigation system for plant establishment that will consist of a buried pipeline running from an existing developed spring to a holding tank and from the holding tank to the planting area. Above-ground lines will deliver water from the buried pipe to the plantings. Trenching for the buried lines will be approximately 18 inches deep, 6 inches wide, and 3,660 ft long and will follow existing maintenance roads except for a short portion running down a hillside from the proposed holding tank. The buried pipe will have a maximum diameter of 3 inches. The tank will be installed close to the ridgeline of a low hill, next to an existing road, and will require a 10 foot x 10 foot gravel or concrete pad.

Environmental Setting

The project site is dominated by California non-native annual grassland. It was historically dry-farmed up to the edge of each bank and much of the soil in the drainage appears to be unconsolidated material that was pushed in when the surrounding fields were tilled. Perhaps due to this, the channel is head-cutting and slumping in several places. There is a high level of ground squirrel activity.

Project Schedule

Irrigation system installation is scheduled to occur between May 1 and October 15, 2009. The remaining plantings are scheduled for installation in the fall and early winter of 2008-2009 or 2009-2010, contingent upon the execution of the Cooperative Agreement.

Equipment Used

A bobcat, dump truck, mower, trencher, and hand labor will be required for the installation of the irrigation system. All plantings will be installed using hand labor. A small four-wheel drive utility vehicle will be used for maintenance activities.

Locations of Staging Areas/Access Roads

The staging area for installing the irrigation system will be located in a flat area adjacent to an existing gravel road. This area currently supports California annual grassland. Access to all planting areas will be made via an existing grassy maintenance road.

Construction Site Restoration

All temporary ground disturbances will be restored to pre-project conditions.

Permanent Erosion Control Measures

To control erosion, any trenched area along a slope will be re-seeded using a site-appropriate erosion control seed mix consisting of native grass species and sterile straw will be applied.

Proposed Avoidance and Minimization Measures

The tank pad and trenching locations will be mowed prior to groundbreaking. Prior to mowing and again prior to groundbreaking, an on-site biologist permitted to handle California tiger salamander and California red-legged frog will clear the area. The on-site biologist will be present during all ground-disturbing activities. He/she will inspect trenches before they are filled. Trenches will be filled as the pipe is laid, with no trenches left open overnight.

3. The following additions are made to the **Avoidance and Protection Measures – Listed Species** on page 6:
 14. If California red-legged frogs or California tiger salamanders are encountered in the action area, work within the immediate vicinity should cease immediately and the Service-approved biologist shall be notified. Based on the professional judgment of the Service-approved biologist, if project activities can be conducted without harming or injuring the California red-legged frog(s) or California tiger salamander(s), the individual(s) shall be left at the location of discovery and monitored by the Service-approved biologist. All project personnel shall be notified of the finding and at no time shall work occur within the vicinity of the listed species without a biological monitor present. If it is determined by the Service-approved biologist that relocating the California red-legged frog(s) or California tiger salamander(s) is necessary, the individual(s) shall be relocated to the nearest suitable habitat within Sycamore Grove Regional Park approved by the Service. Prior to transporting California tiger salamanders or California red-legged frogs to a location other than this approved site (*i.e.*, individuals of either of these two listed animals shall not be moved to laboratories, holding facilities, or other facilities without the written authorization of the Service), written authorization of the Service shall be obtained by the California

Department of Transportation, the Alameda County Resource Conservation District, or the Natural Resources Conservation Service.

15. If California red-legged frogs or California tiger salamanders are encountered in the work area, the Service-approved biologist(s) shall capture California red-legged frogs and California tiger salamanders at the project site by hand, dipnet or other Service-approved methodology. Prior to handling, the Service-approved biologist(s) shall thoroughly wash their hands with soapy water. Oils, creams, lotions, repellents, or solvents of any sort shall not be used within two (2) hours before and during periods when capturing and relocating will occur. Handling of California red-legged frogs and California tiger salamanders shall be minimized to the maximum extent practicable. Immediately following handling, California red-legged frogs and California tiger salamanders shall be placed in a holding container, rinsed with freshwater, transported, and released as soon as practicable the same day of capture.
16. Prior to trenching, vegetation along the trench line shall be mowed to the width necessary to accommodate the trenching equipment and a walking buffer to facilitate locating and avoiding burrows, California tiger salamanders, and California red-legged frogs that may be present within the action area. The biological monitor shall perform clearance surveys within the area to be cleared immediately prior to mowing and shall be onsite during all irrigation installation activities that could result in take, *i.e.* mowing, trenching, vehicular access, *etc.* The biological monitor does not have to be present on site during hand digging of holes or plant installation, but shall be available by phone if a listed species is observed on site.
17. Trenching and installation of irrigation conduit shall be constructed in a manner not to exceed the length that can be trenched, irrigation conduit installed, and backfilled in a single day. All trenches shall be backfilled by the end of work each day; no trenches shall be left open overnight.
18. No work shall occur during or 24 hours following rain events.
19. The biological monitor shall maintain monitoring records that include: (1) the beginning and ending time of each day's monitoring effort; (2) a statement identifying what species, including general wildlife species, were encountered, including the time and location when such species were found; (3) the time the specimen was identified and by whom and its condition; and (4) a description of any actions taken. The biological monitor shall maintain complete records in their possession while conducting monitoring activities and shall immediately surrender records to the Service upon request. All monitoring records shall be provided to the Service upon completion of the monitoring work.
20. Following completion of the work, erosion control measures shall be implemented for all disturbed areas, which may include reseeding using a noxious weed free native seed mix, hydroseeding, jute matting, or tackifying agents to stabilize soils, control dust and prevent erosion.

4. The following additions are made to the **Avoidance and Protection Measures – Listed Species** on page 6:

Avoidance and Protection Measures – Alameda whipsnake

1. A biological monitor will be present during the construction of the water tank pad and all trenching and backfilling activities and will have oversight over implementation of these measures. The biological monitor will have the authority to stop project activities, through communication with the Alameda County Resource Conservation District and the Operator, if any of these measures are not being fulfilled and if the Alameda whipsnake or any other listed species are encountered. If the biologist has requested work to stop due to observation or take of any of the listed species, the Service and the California Department of Fish and Game will be notified within one (1) working day via email or telephone for instructions.
2. A pre-construction survey will be conducted by a biological monitor within the immediate area of construction and where equipment and construction activities will be located. Any work will be delayed and the Service will be contacted if an Alameda whipsnake is encountered.
3. Prior to construction, a biologist will educate construction workers about the Alameda whipsnake and how to avoid them. If a snake is detected during construction, work will halt and the onsite biological monitor will be notified to identify the snake. If the biologist determines that the animal may be an Alameda whipsnake, a Service-approved specialist will be called in to verify the species' identity. If the animal is determined to be an Alameda whipsnake, the snake will be allowed to leave the site passively and the Service will be contacted prior to any additional work.
4. Snake exclusionary fencing shall be erected around the boundaries of the water tank pad construction area and shall be installed prior to the initiation of construction and shall remain in place until all construction equipment is removed from the site. No project activities will occur outside the exclusionary fencing. Exclusionary fencing shall be installed in the following manner:
 - Exclusion fencing shall be a minimum of 36 inches in height and buried to a minimum depth of 4 inches, backfilled, and compacted to prevent snake from passing under the fence in any areas;
 - Fence stakes shall be placed on construction side of the fence (opposite the normal requirement for sediment control);
 - The fencing shall be erected along the work boundaries adjacent to suitable habitat as determined by the Service and DFG. The fence shall be installed with loop-arounds at the ends and at any access openings needed in the fencing in order to redirect the snakes away from the area. Loop-arounds shall be created by installing the last 10 feet of the fence in the shape of a narrow "u" so that parallels to the main fence and forms a space separated by no more than 12-18 inches;

- Fences must be inspected regularly to ensure the integrity of the fence is maintained. Repairs shall be made immediately following discovery.
 - These fences must be maintained through out the Alameda whipsnake's entire active period (March 1 – November 1) or until all construction and landscaping activities have been completed, whichever occurs first. If the project continues into more seasons, fencing must be maintained during the snake's active season until project completion;
 - Additional sediment control fencing may be required as part of other agency permit conditions.
5. Prior to construction of the water tank pad and excavation of the trench, the construction area will be mowed. A qualified biologist will walk ahead of the mower to clear the area prior to mowing.
 6. A qualified biologist will perform a clearance survey before pad construction and trenching commence.
 7. To prevent inadvertent entrapment of Alameda whipsnakes during construction, the trench will be backfilled as the water pipe is installed. No trenches will be left open overnight.
5. The following additions are made to the **Status of Species/Environmental Baseline** after the first paragraph under **San Joaquin Kit Fox** on page 23:

Sycamore Grove Regional Park

The Sycamore Grove Regional Park compensation site for effects to riparian habitat is within potential range of the San Joaquin kit fox and provides suitable habitat for this species. San Joaquin kit fox have the potential to use habitat within the action area for denning, foraging, or dispersal.

6. The following additions are made to the **Status of Species/Environmental Baseline** after the second paragraph under **California Tiger Salamander** on page 29:

Sycamore Grove Regional Park

The Sycamore Grove Regional Park compensation site for effects to riparian habitat is within potential range of the California tiger salamander and provides suitable habitat for this species. There are known occurrences of California tiger salamanders in livestock ponds located on LARPD property within 0.5-mile of the compensation site. This species may use the action area for aestivation, foraging, and dispersal. California tiger salamanders may be present in rodent burrows or deep cracks in the soil, given that ground disturbance will occur within dispersal distance of the nearby ponds.

7. The following additions are made to the **Status of Species/Environmental Baseline** after the second paragraph under **California Red-Legged Frog** on page 35:

Sycamore Grove Regional Park

The Sycamore Grove Regional Park compensation site for effects to riparian habitat is within potential range of the California red-legged frog and provides suitable habitat for this species. There are known occurrences of California red-legged frog in livestock ponds located on LARPD property within 0.5-mile of the compensation site. This species may use the compensation area for foraging and dispersal. California red-legged frogs are not expected to be present in the action area during the dry season when the irrigation system will be installed.

8. The following additions are made to the **Status of Species/Environmental Baseline** after the first paragraph on page 44:

STATUS OF THE SPECIES

Alameda Whipsnake

The Alameda whipsnake was federally listed as threatened on December 5, 1997, (Service 1997). The animal was listed as threatened by the State of California in 1971. Approximately 406,598 acres of critical habitat was designated for the Alameda whipsnake within Contra Costa, Alameda, Santa Clara, and San Joaquin counties on October 3, 2000 (Service 2000). The critical habitat was vacated and remanded on May 9, 2003; proposed again on October 18, 2005; and designated on October 2, 2006 (Service 2006). A draft Alameda whipsnake recovery plan was included in the *Draft Recovery Plan for Chaparral and Scrub Community Species East of San Francisco Bay, California*, issued in November 2002 (Service 2002).

Description: The Alameda whipsnake is a slender, fast-moving, diurnal snake with a narrow neck and a relatively broad head with large eyes. The snake's dorsal surface is sooty black with distinct yellow-orange stripes along each side. The coloration of the snake's ventral surface varies along its length: the anterior portion is orange-rufous; the midsection is cream colored; and the posterior and tail are pinkish. Adults range in length from 3 to 4 feet (Service 1997).

The Alameda whipsnake is one of two subspecies of California whipsnake (*Masticophis lateralis*). The Alameda whipsnake (*M. l. euryxanthus*) is distinguished from the other subspecies, the chaparral whipsnake (*M. l. lateralis*), by its sooty black dorsum; wider lateral yellow-orange stripes; the lack of a dark line across the rostral; an uninterrupted light stripe between the rostral and eye; and the virtual absence of spotting on the venter of the head and neck.

Distribution: The Alameda whipsnake inhabits the inner Coast Ranges in western and central Contra Costa and Alameda counties (Jennings 1983; McGinnis 1992; Swaim 1994) where it is found in a variety of vegetation communities including chamise-redshank chaparral, mixed chaparral, coastal scrub, annual grassland, blue oak-foothill pine, blue oak woodland, coastal oak woodland, valley oak woodland, eucalyptus, redwood, and riparian (CDFG 2008).

Habitat Requirements: Scrub and chaparral communities are the primary habitat types essential for providing space, food, and cover necessary to sustain all life stages of the Alameda whipsnake. Associated scrub habitat typically consists of Diablan sage scrub, coyote bush scrub, and chamise chaparral (Swaim 1994), and is also classified as coastal scrub, mixed chaparral, and chamise-redshank chaparral (CDFG 2008). Swaim (1994) found that core scrub habitat areas (areas of concentrated use by Alameda whipsnakes, based on telemetry and trapping data) tended to occur on east, southeast, south or southwest facing slopes and were within 500 feet of open or partially-open canopy or grassland habitat. Alameda whipsnakes have also been found in open chaparral stands with a northern exposure (K. Swaim, Swaim Biological Consulting, personal communication with the Service 2004). As a result of incidental observations and trapping surveys, Alameda whipsnakes have been discovered greater than 600 feet and as much as 21,600 feet from primary scrub and chaparral habitat (K. Swaim, Swaim Biological Consulting, personal communication with the Service 2004).

Alameda whipsnakes are also known to use other habitat types adjacent to their primary scrub and chaparral habitat. McGinnis (1992) has documented Alameda whipsnakes using oak woodland/grassland habitat as a corridor between stands of northern coastal scrub. Grassland habitats appear to be used extensively by male Alameda whipsnakes during the spring mating season (Swaim 1994). Females appear to use these grassland areas more extensively after mating (Swaim 1994), possibly looking for suitable egg-laying sites or for dispersing to other scrub habitat (K. Swaim, Swaim Biological Consulting, personal communication with the Service, 2002). Alvarez et al. (2005) indicated that Alameda whipsnakes use a broader association of habitats including annual grassland, oak woodland, riparian and other non-native and disturbed open habitats at distances averaging 1,041 m (0.6-mile) and exceeding 7,300 m (4.54 miles) from chaparral/scrub plant communities based on occurrence data analyzed from 1948 to 2004. Egg-laying sites have been found close to scrub communities in grasslands with scattered shrubs (Swaim 1994) and in true scrub communities (K. Swaim, Swaim Biological Consulting, personal communication with the Service, 2002). These other habitat areas may be important in the early life history stages of hatchling whipsnakes (Swaim 1994). Rock outcrops, talus, and burrows (mating habitats) need to be within dispersal range of scrub and grassland habitat (egg-laying habitats). Swaim (1994) also observed Alameda whipsnakes mating in rock outcrops.

Alameda whipsnakes require plant canopy covers that supply a suitable range of temperatures, corridors of plant cover and retreats (including rock outcrops) sufficient to provide dispersal pathways between areas of habitat, and plant community patches of sufficient size to prevent the deleterious effects of isolation, such as inbreeding or the loss of a subpopulation due to a catastrophic event. Specific habitat features used by Alameda whipsnakes include, but are not limited to, small mammal burrows, rock outcrops, talus, soil crevices, debris piles, and other forms of cover to provide temperature regulation, shelter from predators, egg-laying sites, and winter hibernacula (Swaim 1994). Adequate insect populations are also necessary to sustain their primary lizard prey populations.

Life History: Survey data suggests that the Alameda whipsnake exhibits a bimodal season activity pattern with peak activity in the spring and late summer/early fall (Swaim 1994). Male Alameda whipsnakes appear to be more active than females in the spring,

which is likely attributed to breeding season behavior (Swaim 1994). The breeding season is thought to be between March and June, and mating appears to typically occur near the female's hibernacula (Swaim 1994). During the mating season, females likely remain near their retreat sites while males disperse throughout their home ranges. In one study, Swaim (1994) estimated a mean individual home range size for four males was 13.6 acres, and 8.4 acres for two females. Gravid female Alameda whipsnakes likely lay eggs between May and July (Stebbins 2003). Clutch sizes are typically between 6 to 11 eggs and the young hatch and emerge in the late-summer to early-fall (Swaim 1994). Male and female snakes appear to exhibit similar movement and activity patterns following the breeding season (Swaim 1994). Increases in late summer/early fall activity may be attributed to emergence of hatchling whipsnakes and the increased availability of hatchling lizard prey (Swaim 1994). Alameda whipsnakes typically retreat into winter hibernacula in November and emerge in March.

Alameda whipsnake above-ground activity cycles appear to be highly temperature dependent. Alameda whipsnakes have the highest documented mean active body temperature (92.1 degrees Fahrenheit) and degree of body temperature stability (stenothermy) than other snake species under natural conditions (Swaim 1994). Maintenance of such a high body temperature likely enables the snake to capture its characteristically fast-moving prey (Swaim 1994). Open and partially open and/or low growing shrub communities provide a mosaic of sunny and shady areas that apparently allow the snake to effectively maintain sufficient body temperature while providing cover from potential predators (Swaim 1994).

The Alameda whipsnake is an active diurnal predator and hunts by holding its head high off the ground to peer over vegetation or rocks for potential prey. This foraging strategy corresponds with the open habitat with which this species is typically associated with (Swaim 1994). Its diet includes lizards, skinks, frogs, small mammals, snakes, nesting birds, and insects. Features such as small mammal burrows, rock outcrops, and talus provide important habitat components such as shelter from predators, egg-laying sites, over-night retreats, and winter hibernacula (Swaim 1994). Their lizard prey is often abundant in these areas as well. Lizards, especially the western fence lizard, appear to be the Alameda whipsnake's primary prey item (Stebbins 2003; Swaim 1994).

Threats: Urban development has fragmented the once contiguous range of the Alameda whipsnake into the following five population centers: (1) the Tilden-Briones population (Sobrante Ridge, Tilden/Wildcat Regional Parks to the Briones Hills, in Contra Costa County); (2) the Oakland-Las Trampas population (Oakland Hills, Anthony Chabot area to Las Trampas Ridge, in Contra Costa County); (3) the Hayward-Pleasanton Ridge population (Hayward Hills, Palomares area to Pleasanton Ridge, in Alameda County); (4) the Mount Diablo-Black Hills population (Mount Diablo vicinity and the Black Hills, in Contra Costa County); and (5) the Sunol-Cedar Mountain population, (Wauhab Ridge, Del Valle area to the Cedar Mountain Ridge) (Service 1997).

Habitat fragmentation appears to have resulted in little to no gene flow or interchange between the five populations. Interchange between the Tilden-Briones, Oakland-Las Trampas, and Hayward-Pleasanton Ridge populations appears to depend on dispersal over the Caldecott Tunnel in Contra Costa County; under State Route 580 in Alameda

County (at the Eden Canyon interchange); under the Dublin Boulevard undercrossing; or where San Lorenzo Creek passes under the highway (Service 1997). Interchange between the Hayward-Pleasanton Ridge and Sunol-Cedar Mountain populations depends on dispersal along Alameda Creek in Alameda County; crossing under I-680 (where the creek passes under the highway); or crossing under the highway at Scott's Corner along Vallecitos Creek, or where two unnamed tributaries to Arroyo de la Laguna cross under I-680 north of Scott's Corner (Service 1997). The Mount Diablo-Black Hills population appears to be completely isolated from the other populations (Service 1997).

Habitat fragmentation makes some Alameda whipsnake populations more vulnerable to extinction. Habitat patches with high edge to interior ratios are known to provide less value for some species than round or square patches (Jimerson and Hoover 1991; Saunders *et al.* 1991). In general, the species most prone to extinction in fragmented habitats are those that depend on native vegetation; require combinations of different habitat types; require large territories; and exist at low densities (Saunders *et al.* 1991). Alameda whipsnakes have been associated with a variety of habitats for different natural history functions. They are primarily associated with native Diablan sage scrub, but are known to forage in adjacent grasslands, and migrate along riparian corridors. Consistent low trap success and high recapture rates suggests Alameda whipsnakes may be sparse, even in suitable habitat (Swaim 1994). The combination of these factors may cause the Alameda whipsnake to be more vulnerable to extinction in small habitat patches resulting from habitat fragmentation.

Small populations with limited breeding partners are prone to inbreeding which often results in problems associated with the lack of genetic diversity (Frankham and Ralls 1998). Populations with less genetic variability or more deleterious genetic material are typically less able to successfully respond to environmental stresses or adapt to even relatively minor changes in environmental conditions. These factors influence the survivability of smaller, genetically isolated populations.

The Alameda whipsnake has a variety of potential native and exotic predators including California kingsnake (*Lampropeltis getula californiae*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), opossum (*Didelphis virginianus*), coyote (*Canis latrans*), gray fox (*Vulpes cinereoargenteus*), red fox (*V. vulpes*), and red-tailed hawk (*Buteo jamaicensis*). Urbanization often facilitates the introduction or spread of non-native predators (Goodrich and Buskirk 1995). Increased predatory pressure may become excessive in situations where Alameda whipsnake habitat is fragmented, isolated, and otherwise degraded by human activities. This may be especially true where alien species, such as rats, feral pigs (*Sus scrofa*), and feral and domestic cats (*Felis domesticus*) and dogs (*Canis familiaris*) are present. These additional threats become particularly acute where urban development immediately adjacent to Alameda whipsnake habitat. A growing movement to maintain feral cats in parklands, such as those managed by East Bay Regional Park District, is a potential threat to a variety of wildlife species (Coleman *et al.* in litt. 1997; Roberto 1995; DeVecchio 1997). Little is known about the predation of Alameda whipsnakes, but feral cats are known to prey on reptiles, including the yellow racer (*Coluber mormon*), a fast, diurnal snake similar to the Alameda whipsnake (Hubbs 1951; Stebbins 2003). The threat of predation and harassment from domestic and feral cats and other non-native species increases as human disturbance from recreational use on

regional and state parks, and urban development encroaches into the current open space buffers between existing developments and Alameda whipsnake habitat on public lands (Coleman *et al.* in litt. 1997).

McGinnis (1992) has suggested that grazing has impacted Alameda whipsnake habitat in many areas east of the Coast Range. Livestock grazing that significantly reduces or eliminates shrub and grass cover can be detrimental to this snake. Many snake species, including the Alameda whipsnake, likely avoid such open areas due to increased danger from predators and lack of prey (McGinnis 1992). Removed native vegetation is often replaced by non-native plant species that significantly degrade habitat values or even replace entire plant communities such that it no longer provides appropriate habitat for the Alameda whipsnake. For instance, radio telemetry data indicates that Alameda whipsnakes tend to avoid dense stands of eucalyptus (Swaim 1994).

The Alameda whipsnake is directly and indirectly threatened by the effects of fire suppression. Fire suppression results in a buildup of fuel (underbrush, thatch, and woody debris). This exacerbates the effects of wildfires by creating conditions for hot, slow-moving fires. The development of a closed scrub canopy also results in a buildup of flammable fuels over time (Parker 1987; Rundel *et al.* 1987). Fire suppression can also result in the spread and proliferation of non-native vegetation, further increasing flammable fuel loads in and around Alameda whipsnake habitat. The threat of wildfire is typically highest in the summer and early fall when accumulated fuel is abundant and dry. This "fire season" coincides with the primary above-ground activity period for hatchling and adult Alameda whipsnakes (Swaim 1994). Therefore, populations are likely to sustain heavy losses from fires during this period.

Changes in the vegetation structure typically results in changes to the micro-climate temperature regime important in maintaining the Alameda whipsnake's high optimal body temperature. For instance, fire suppression may result in increased canopy closure and shading (Parker 1987) from plant species such as poison oak (*Toxicodendron diversilobum*) and coyote brush (*Baccharis pilularis*). Increased vegetative cover can result in ground temperatures that are less than optimal for the Alameda whipsnake. Survey data suggests that Alameda whipsnakes are less likely to be found in areas of scrub habitat with a closed canopy (Swaim 1994).

Encroaching urban development has lead to the implementation of rigorous fire suppression practices in and around adjacent suitable Alameda whipsnake habitat. Frequent fire events are important in maintaining the scrub habitat associated with the Alameda whipsnake. Many native coastal scrub and chaparral plant species require periodic fires to stimulate new sprouting, seedling recruitment, and seed dispersal (Parker 1987; Keeley 1987; Keeley 1992). The optimal frequency of fire events is often disputed but likely ranges from every 10 to 30 years (Keeley 1987; Rundel *et al.* 1987). Depending on the rate of fuel accumulation, any prescribed burn program should take place every 10 to 30 years (J. Ferreira, California Department of Parks and Recreation, personal communication with the Service 1996).

All five remaining populations of the Alameda whipsnake are threatened by a variety of factors. Each of these populations consists of several to numerous subpopulations with

varying degrees of connectivity between them. In the western portion of the species' range, the Tilden-Briones population is threatened by a high potential for catastrophic wildfire and urban development. However, the remaining habitat, regional parklands, and municipal watersheds within this area overlap to the extent that a regional preserve may be possible. The Oakland-Las Trampas population is threatened by a high potential for catastrophic wildfire and the negative effects associated with habitat fragmentation and urban development. The Hayward-Pleasanton Ridge population may be the most susceptible to extirpation. This population is scattered in distribution and is, therefore, more vulnerable to the effects of development and subsequent habitat fragmentation. The Mount Diablo-Black Hills population, in the eastern portion of the species' range, is threatened by a high potential for catastrophic wildfire, development and its associated impacts, and inappropriate grazing practices. If threats associated with urbanization can be controlled, this population is a good candidate for recovery, due to the inclusion of public lands and the potential for improved fire and grazing management on parklands. The Sunol-Cedar Mountain population is threatened by development and inappropriate grazing practices. Overall, the Oakland-Las Trampas and Hayward-Pleasanton Ridge populations are the most immediately imperiled with habitat fragmentation becoming prevalent enough to compromise its long-term viability.

Recovery: Seven recovery units have been identified for the Alameda whipsnake (Service 2002). The proposed compensation site at Sycamore Grove Regional Park is located within the Sunol-Cedar Mountain Recovery Unit (Unit 5). This is the southernmost unit and comprises an area of interface between Alameda whipsnake and San Joaquin whipsnake. Much of this area consists of East Bay Regional Park District, San Francisco Water District, California Department of Parks and Recreation, U.S. Department of Energy (Lawrence Livermore National Laboratory), and private properties. The recovery plan recommends that landowners within Unit 6 implement plans to address health of chaparral/scrub, fire management, recreation, unauthorized collection, and incompatible land uses. The recovery plan also specifies the importance of habitat restoration, including return of fire as a natural disturbance regime, removal of nonnatives or vegetation that overtops chaparral/scrub, and providing rock outcrops or other forms of retreat or hibernacula as being a priority within this unit.

ENVIRONMENTAL BASELINE

Alameda Whipsnake

The California Natural Diversity Database (California Department of Fish and Game 2008) includes two records of Alameda whipsnake observations within 1 mile and three within 3 miles of the action area. The closest of the three observations is an unconfirmed sighting in the orchard immediately adjacent to the subject drainage from a former Sycamore Grove Regional Park employee (K. Swaim pers. comm. on August 20, 2008). The second occurrence is located approximately 0.9-mile to the southeast on the north side of Del Valle Canyon downstream of the Del Valle Reservoir. The third occurrence is located on the east shoreline of Del Valle Reservoir dating back to 1975. Based on the habitat located within and adjacent to the action area, the biology and ecology of the Alameda whipsnake, including its dispersal behavior, and the nearby records of the listed

species, the Service has concluded it is likely this listed animal utilizes the action area for foraging, resting, mating, and other essential behaviors.

9. ADD the following text after the second paragraph of the **Effects of the Proposed Action** on Page 45:

Sycamore Grove Regional Park

The proposed riparian compensation activities consisting of equipment access, trenching, staging, and installation of an irrigation infrastructure at Sycamore Grove Regional Park may result in adverse effects to the San Joaquin kit fox, California tiger salamander, California red-legged frog, and Alameda whipsnake. There is a likelihood the proposed activities may directly affect individuals of these listed species by causing mortality or injury resulting from being crushed by rocks or equipment, or entombed in dens or in trenches, or harassment from construction noise, vibration or light. These species may be indirectly affected by construction activities temporarily altering foraging, movement patterns or refugia habitat, or subjecting them to predation that otherwise would not occur. The proposed action will result in the temporary loss and degradation of 0.04-acres and the permanent loss of 0.002-acre of the habitat of the San Joaquin kit fox, California tiger salamander, California red-legged frog, and Alameda whipsnake comprising entirely of non-native annual grassland.

10. Change the first paragraph under *San Joaquin Kit Fox* of the **Effects of the Proposed Action** on Page 45 from:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species.

TO:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed road project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species. The Phase I activities at the Sweet Ranch property would result in the conversion of 0.09 acres of upland habitat for the San Joaquin kit fox to additional wetland habitat and possible construction-related harassment

of an unknown number of San Joaquin kit foxes. *The riparian compensation activities at the Sycamore Grove Regional Park would result in the temporary loss and degradation of 0.04-acre of grassland habitat resulting from equipment staging, trenching activities, and the construction of an access road and an irrigation system; and permanent loss of 0.002-acre of grassland habitat resulting from the construction of a holding take. Activities may result in construction related harassment and harm of an unknown number of San Joaquin kit foxes. The riparian compensation activities will have a net beneficial effect to the San Joaquin kit fox by providing greater habitat diversity, increasing prey base of small rodents and insects, increasing protective cover, and stabilizing erosion within the drainage.*

11. Change the first paragraph under *California Tiger Salamander* of the **Effects of the Proposed Action** on Page 53 from:

The proposed Pigeon Pass Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to desiccation, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as raccoons, crows, and ravens, to the sites, who could subsequently prey on the listed amphibian. Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or desiccation (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander.

TO:

The proposed Pigeon Pass Road Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed road project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to desiccation, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during nighttime construction. Edible trash left during or after repair activities could attract predators, such as raccoons, skunks, opossums, crows and ravens, that could subsequently prey on the listed amphibian.

Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or desiccation (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed road project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander. *The riparian compensation activities at the Sycamore Grove Regional Park would result in the temporary loss and degradation of 0.04-acre of upland habitat resulting from equipment staging, trenching activities, and the construction of an access road and an irrigation system; and permanent loss of 0.002-acre of upland habitat for the California tiger salamander. Activities may result in construction related harassment and the death of an unknown number of California tiger salamanders. The riparian compensation activities will have a net beneficial effect to the California tiger salamander by increasing protective cover and stabilizing erosion within the drainage.*

12. Change the first paragraph under *California Red-legged Frog* of the **Effects of the Proposed Action** on Page 57 from:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County.

TO:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed road project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County. Phase 1 activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland intended to provide breeding habitat for the California red-legged frog. *The riparian compensation activities at the Sycamore Grove Regional Park would result in the temporary loss and degradation of 0.04-acre of upland habitat resulting from equipment staging, trenching activities, and the construction of an access road and an irrigation system; and permanent loss of 0.002-acre of upland habitat*

for the California red-legged frogs. Activities may result in construction related harassment and the death of an unknown number of California red-legged frogs. The riparian compensation activities will have a net beneficial effect to the California red-legged frog by increasing the prey base, increasing protective cover, and stabilizing erosion within the drainage.

13. ADD the following text at the end of the **Effects of the Proposed Action** on Page 60:

Alameda Whipsnake

Individual Alameda whipsnakes may be directly injured or killed by activities that disturb feeding, sheltering, and dispersal habitat. The proposed action would result in adverse effects to Alameda whipsnake that may be dispersing, foraging, and/or aestivating in the action area, and would result in the temporary loss and degradation of 0.04-acres and the permanent loss of 0.002-acre of the habitat for this listed species. The effects will likely (1) result in the injury and death of an unknown number of Alameda whipsnakes by entombment in burrows; (2) result in construction-related harassment to Alameda whipsnakes in the area; (3) temporarily impede the dispersal or daily movement of Alameda whipsnakes through the area while the action is in progress; and/or (4) increase the likelihood of predation on Alameda whipsnakes.

Construction related activities may cause disruption of foraging, harassment from increased human activity, and permanent and temporary loss of shelter. Because Alameda whipsnakes are diurnal, they will be active while construction is performed. Individuals that avoid construction activities may become displaced into adjacent areas where they may be vulnerable to increased predation, exposure, starvation, or stress through disorientation, loss of shelter, and intraspecific and inter-specific aggression (Grigione 2002). The conservation measures that will be implemented at the proposed project will likely reduce mortality, injury, harassment, or harm to the Alameda whipsnake.

The proposed compensation activities at Sycamore Grove Regional Park would likely improve the habitat quality within the action area by enhancing a sparsely vegetated riparian corridor, thereby increasing refugia, hibernacula, escape cover, and foraging habitat.

14. Change the **Amount or Extent of Take** section beginning on page 62 from:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, the animal may range over a large territory, it is primarily active at night, it is a highly intelligent animal that is often extremely shy around humans, and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17. acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass

Project in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to located in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment and based on the November 8, 2004, site visit,

will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

TO:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, may range over a large territory, is primarily active at night, highly intelligent, and often extremely shy around humans; making finding an injured or dead individual unlikely. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17. acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. *In addition, San Joaquin kit foxes inhabiting the riparian compensation site at Sycamore Grove Regional Park will be subject to incidental take during the restoration activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including compensation activities at Sycamore Grove Regional Park, in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.*

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect, because when this amphibian is not in their breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels and other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. *In addition, California tiger salamanders inhabiting the riparian compensation site at Sycamore Grove Regional Park will be subject to incidental take during the restoration activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including compensation activities at Sycamore Grove Regional Park, in the form of harm and harassment of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.*

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their

cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. *In addition, California red-legged frogs inhabiting the riparian compensation site at Sycamore Grove Regional Park will be subject to incidental take during the restoration activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including compensation activities at Sycamore Grove Regional Park, in the form of harm and harassment of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.*

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to located in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment for the road project and based on the November 8, 2004, site visit, will be subject to incidental take. The proposed Phase I and II activities at the Sweet Ranch property are not expected to adversely affect the vernal pool fairy shrimp and will not result in incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service expects that incidental take of the Alameda whipsnake will be difficult to detect or quantify because this animal may range over a large territory and the finding of an injured or dead individual is unlikely because of their relatively small body size and conspicuous coloration. Therefore, the Service is estimating that all of the Alameda whipsnakes inhabiting the riparian compensation site at Sycamore Grove Regional Park will be subject to incidental take during the restoration activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including compensation activities at Sycamore Grove Regional Park, in the form of harm and harassment of the Alameda whipsnake caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

15. The following addition is made to the **Terms and Conditions** on page 71:

26. There shall be an adequate number of Service-approved biologists to monitor the effects of the project on the San Joaquin kit fox, California tiger salamander, California red-legged frog, and Alameda whipsnake. The number of Service-approved biologists who are on site shall be determined by the Service, California Department of Fish and Game, and/or the California Department of Transportation biologist.
27. Excavation of ground squirrel and rodent burrows to salvage California tiger salamanders shall be done with hand tools whenever possible. The depth to which this amphibian is found depend on the burrow-specific conditions. Excavation shall extend into the moist areas of the burrows that can sustain these amphibians through the dry summer months. The depth at which these animals are found shall be recorded whenever possible and the information shall be provided to the Service and the California Department of Fish and Game.
 - a. Prior to handling, the Service-approved biologist(s) shall thoroughly wash their hands with soapy water. Oils, creams, lotions, repellents, or solvents of any sort shall not be used within two (2) hours before and during periods when capturing and relocating will occur. To minimize transmission of infectious agents among amphibians, vinyl gloves shall be worn while handling California tiger salamanders, and changed between individuals. Prior to handling, vinyl gloves shall be rinsed in freshwater to remove any residual surface chemicals used during the production process. Handling of juvenile and adult California tiger salamanders shall be minimized to the maximum extent practicable; handling of larvae shall not exceed 90 seconds. Immediately following handling, California tiger salamanders shall be placed in a holding container, rinsed with freshwater, and observed for a period of 30 minutes prior to release for signs of impairment, tissue necrosis, or mechanical damage associated with contact with gloves, equipment, or improper handling. Note that recent studies by Cashins et al. (2008) indicate that latex or nitrile gloves can be lethal to tadpoles; therefore, such gloves shall not be used to handle amphibians of any life stage of any species. The holding container shall be kept in a cool location with moist with damp paper towels or a saturated soap-free sponge. If possible, only one frog or salamander shall be placed in each plastic container. More than one animal can be placed in a shoe box-sized or larger container; however, the two listed species or the same species of significantly different sizes or life history stages shall not be mixed in order to avoid injury or depredation. Individuals shall never be so crowded that they are touching one another. Crowding can cause stress reactions and even death. California tiger salamanders secrete a milky or bubbling substance when stressed. The secretion is often accompanied by body arching and outstretched limbs when stress has reached lethal levels.
 - c. California tiger salamanders shall be released as soon as possible within the same day they are captured. If circumstances dictate that the individual(s) cannot be released the same day the Service shall be contacted immediately for further guidance.

- d. California tiger salamanders shall be released at the nearest location that is outside of the construction area and shall be placed at the mouth of a ground squirrel or other rodent burrow of suitable size. If burrow density allows, only one animal shall be released per burrow. A maximum of three California tiger salamanders may be placed in extensive burrows. The ground squirrel burrows or other rodent burrows must be currently used by the appropriate rodent species and the burrows must have moist and cool conditions to support salamanders. Salamanders can be encouraged to enter the burrows by gently nudging if they do not enter on their own. Individuals shall be released one at a time rather than en masse. The Service-approved biologist shall monitor the released individuals to ensure they retreat to safety and do not return to the construction area.

16. Add the following reference to the **Literature Cited** on page 75:

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- Jimerson, T. and L. Hoover. 1991. Old-growth forest fragmentation: Changes in amount, patch size and edge as a result of logging. Pages 168-174 in: Proceedings of the symposium on biodiversity of northwestern California. October 28-30, 1991, Santa Rosa, California.
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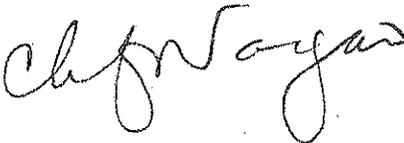
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- Parker, V.P. 1987. Can native flora survive prescribed burns? *Fremontia* 14(4): 3-6.
- Roberto, P. 1995. The cat rescue movement vs. wildlife defenders: whose right to live. *California Coast and Ocean* 11:31-40.
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- Saunders, D.A., R.J. Hobbs, and C.R. Margules. 1991. Biological consequences of ecosystem fragmentation: a review. *Conservation Biology* 5:18-32.
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The remainder of the February 28, 2005 Biological Opinion and Conference Opinion is unchanged. This concludes reinitiation of the formal consultation on the State Route 84 Pigeon

Pass Curve Realignment Project in Alameda County, California. As provided in 50 CFR § 402.16, re-initiation 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, any operations causing such take must cease pending re-initiation.

If you have any questions regarding this amendment to the biological opinion on the State Route 84 Pigeon Pass Curve Realignment Project, please contact Jerry Roe, Endangered Species Biologist, (Jerry_Roe@fws.gov) or (Chris_Nagano@fws.gov) at the letterhead address or at telephone (916) 414-6600 if you have any questions.

Sincerely,


fn Cay C. Goude
Acting Field Supervisor

cc:

Margaret Gabil, California Department of Transportation, District 4, Oakland, California
Melissa Escaron, California Department of Fish and Game, Yountville, California
Marcia Grefsrud, California Department of Fish and Game, Yountville, California
Liam Davis, California Department of Fish and Game, Yountville, California
Scott Wilson, California Department of Fish and Game, Yountville, California
Brendan Thompson, Regional Water Quality Control Board, Oakland, California
Keith Lichten, Regional Water Quality Control Board, Oakland, California
Jackie Charbonneau, Natural Resources Conservation Service, Livermore, California



United States Department of the Interior

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



In Reply Refer To:
81420-2008-F-0214-3

APR 27 2010

Mr. Jim Richards
Attn: Laura Ivey
Office of Biological Sciences and Permits
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Subject: Reinitiation of Consultation of the Biological Opinion for the State Route 84 Pigeon Pass Curve Realignment Project, Alameda County, California (Service File No. 1-1-04-F-0115) for the Inclusion of Phase II of Mitigation Activities at Sweet Ranch, Livermore, California

Dear Mr. Richards:

This is in response to your April 22, 2008 request for reinitiation of formal consultation to amend the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project located in Alameda County, California (Service File No.: 1-1-04-F-0115) issued on February 28, 2005. This amendment addresses Phase II activities at the Sweet Ranch property located approximately 6 miles east of downtown Livermore, Alameda County, California. On November 5, 2007 the Service issued an amendment to the Pigeon Pass Biological Opinion (Service File No.: 81420-2008-F-0214) for the first phase of the mitigation activities on the Sweet Ranch property. The activities associated with the first phase (Phase I) of work (*e.g.*, creation of a seasonal pond and exotic species removal) was completed in December 2007. This document represents the Service's biological opinion on the effects of the action on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), threatened California red-legged frog (*Rana aurora draytonii*), and threatened California tiger salamander (Central Valley Distinct Population Segment) (*Ambystoma californiense*). This amended biological opinion is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act).

The California Department of Transportation (Caltrans) proposes to use the 97.7 acre Sweet Ranch as compensation for 52 acres for effects to the San Joaquin kit fox and riparian and seasonal wetland habitat resulting from the project. The Sweet Ranch will be considered as compensation for the San Joaquin kit fox by the Service when Caltrans has satisfied the requirements for a conservation easement, habitat management plan, and management

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endowment. In addition, Caltrans would like to consider the remaining easement acreage as future mitigation for San Joaquin kit fox, California tiger salamander and/or California red-legged frog. This proposal was outlined and deemed appropriate in a letter from the Service dated March 21, 2007 (Service File No.: 1-1-07-TA-0780).

This amended biological and conference opinion is based on: (1) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment Project, Southwest of Livermore, Alameda County, California* (Service File No. 1-1-04-F-0115) dated February 28, 2005 prepared by the U.S. Fish and Wildlife Service (Service); (2) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-04-F-0116) dated April 21, 2005; (3) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-07-F-0159) dated May 2, 2007; (4) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-07-F-0268) dated July 20, 2007; (5) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 81420-2008-F-0214) dated November 5, 2007; (6) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County, California for the Inclusion of the Installation of an Underground AT&T Phone Line to the Mullenex Residence at 2980 Vallecitos Road, Livermore, California* (Service File No. 81420-2008-F-0214-2) dated April 17, 2008; (7) a request for an amendment to the Biological Opinion and Conference Opinion from the California Department of Transportation, dated April 22, 2008; (8) Sweet Ranch Memorandum from Caltrans dated April 22, 2008 and supporting documentation; (9) correspondence between Alison Graff (Caltrans), and Jerry Roe (Service) on April 22, 2008; (10) site visit conducted with the Natural Resources Conservation Service and Caltrans on May 15, 2008; and (11) other information available to the Service.

The following changes are made to the February 28, 2005 Biological Opinion:

1. Add the following to the **Consultation History**:

April 22, 2008	Email correspondence between the Service and Caltrans regarding the Phase II of mitigation activities on the Sweet Ranch.
April 24, 2008	The Service received a request to amend the February 28, 2005 Biological Opinion and Conference Opinion to include Phase II of the mitigation activities on the Sweet Ranch.
May 15, 2008	The Service attended a site visit to the Sweet Ranch with Caltrans and the Natural Resources Conservation Service to discuss Phase II of the mitigation activities.
June 10, 2008	The Service issued a draft amendment to Caltrans for review and comments with regards to the draft amendment to the biological opinion for Phase II of mitigation at Sweet Ranch.

June 24, 2008	The Service received comments from Caltrans with regards to the draft amendment to the biological opinion for Phase II of mitigation at Sweet Ranch.
April 1, 2010	The Service received final comments from Caltrans with regards to the draft amendment to the biological opinion for Phase II of mitigation at Sweet Ranch.

2. Add the following to the **Description of Proposed Action:**

Caltrans proposes to restore 4,810 linear feet of creek corridor at the Sweet Ranch, a private property located approximately 6 miles east of downtown Livermore. Along this stretch of creek, 4.7 acres of mixed riparian habitat will be restored/enhanced, 2.4 acres of bed and bank will be improved and 4.0 acres of seasonal wetlands will be created.

An in-perpetuity conservation easement, management endowment and a long-term conservation practices management plan are conditions of the easement. In October 2009, the State and the property owner executed a conservation easement on the Ranch. The State will hold the easement until a successor entity acceptable to the property owner and resource agencies is found to hold the easement and endowment. The conservation easement was reviewed and approved by the Service and the Regional Water Quality Control Board. The Service is a third party signatory to the conservation easement.

Project Summary

The key elements of the proposed Sweet Ranch conservation site habitat restoration, enhancement, and creation activities were divided into two phases. The activities associated with the first phase were completed in December 2007. These activities were included in the November 5, 2007 amendment to the Biological Opinion for the Effects of the State Route 84 Pigeon Pass Curve Realignment Project, Alameda County (Service File No.: 81420-2008-F-0214).

Activities executed during Phase 1 included:

1. Seasonal Pond Creation: Excavation of a seasonal pond suitable for breeding by the California tiger salamander and potentially the California red-legged frog.
2. Exotics Removal: Eucalyptus (*Eucalyptus globulus*) tree removal in the riparian corridor. A total of two trees were removed.

The activities proposed for Phase 2 include:

1. Wetland Creation
 - a. The Bowl Areas: Creation of seasonal wetlands in the two upland bowl areas.
 - b. Wet Meadow: Wet meadow creation in the westernmost reach of the existing riparian corridor.
 - c. Pond/Spring Enhancement: Enhancement of the newly created seasonal pond and existing spring.

2. Riparian Restoration
 - a. Debris and Exotic Species Removal: Removal and control of non-native, invasive plant species and removal of existing debris along the western reach of the existing riparian corridor.
 - b. Riparian Planting: Planting of native riparian vegetation in the eastern reaches of the existing riparian corridor, where little riparian vegetation currently exists.
3. Grade Stabilization
 - a. Boulder Weirs: Installation of rock weirs along the creek to slow head-cutting and potentially expand existing in-stream wetlands.
4. Culvert Improvements
 - a. Culvert Replacement: Removal and replacement of one large culvert (at the existing driveway road behind the house).
 - b. Culvert Extension: Extension of an existing culvert to improve the outfall or placement of rock slope protection to prevent further erosion.
5. Ranch Infrastructure
 - a. Fence: Installation of a temporary livestock exclusion fence around the riparian corridor and wetland creation areas.
 - b. Access Road: Improvement of existing access road.
 - c. Corral: Installation of one corral made from portable fence panels and a chute for working livestock.
 - d. Water Supply: Installation of a livestock water and irrigation system.

Project Scope

Wetland Creation

Bowl Areas

The design for the creation of seasonal wetlands in these two areas includes a series of shallow depressions lined with a bentonite clay liner to allow short-term retention of runoff water. Because of the degree of change in elevation from one end of the basin to the other, a stepped/terraced design will be used in these locations. Wetland areas will be seeded and planted with the appropriate native plants. A total of approximately 1.0-acre of seasonal wetland will be created at these locations.

Wet Meadow

A wet meadow will be created in the gently sloping field at the westernmost reach of the intermittent stream immediately upstream of Cross Road. This will be accomplished by re-grading the field and existing channel and constructing a series of ponded terraces separated by earthen berms. Rock-lined drop structures will be installed as spillway structures between the ponded areas. Wetland areas will be seeded and planted with the appropriate native plants. Approximately 3.0 acres of seasonal wetland will be created at this location.

Pond/Spring Enhancement

The seasonal pond that was constructed during Phase 1 of the project will be tested for bulk density and recompact as necessary to achieve its full water holding potential. The existing western spring originates at the toe slope of the hill, above the newly constructed pond location. Water from the spring flows towards the newly constructed pond for a short distance and then infiltrates into the soils before it reaches the pond. The spring is perennial and was once used to supply water to the on-site residence. The spring will be excavated to bring water to the surface, allowing flow to the new pond, or redeveloped with a new spring box and pipe. Wetland areas will be seeded and planted with the appropriate native plants.

Riparian Restoration

Debris and Exotic Species Removal

Approximately 2,000 linear feet of the eastern reach of the riparian corridor will be enhanced through exotic species and debris removal. This area has an understory dominated by German ivy (*Delawarea odorata*), periwinkle (*Vinca major*), and similarly undesirable invasive exotic species. Two eucalyptus trees were removed during Phase 1 and another dozen will be removed during Phase 2, provided an agreement can be reached with the adjacent landowner (trees are outside of the easement area).

Exotics removal will be accomplished with a combination of mechanical and manual removal techniques and application of the herbicide Rodeo (glyphosate). The herbicide is needed to accomplish habitat enhancement at Sweet Ranch due to the extensive cover of German ivy and periwinkle in the riparian corridor and a net benefit to California red-legged frogs is expected. California red-legged frogs have not been documented at Sweet Ranch; however, individuals have been reported from a livestock pond at least one-half mile from the project site. Herbicides will be applied in the dry season only to treat German ivy and periwinkle between May 1 and October 15 outside of the breeding season, and will not be applied within 72 hours of forecasted precipitation. All exotic vegetation removed manually will be taken off site and disposed of at an approved green waste facility.

Debris (*e.g.* wire rolls, old tires, appliances, old farm equipment, *etc.*) will be removed from the channel. All debris will be taken off site and disposed of at an appropriate waste/recycling facility.

Riparian Plantings

Approximately 4,810 linear feet of riparian corridor will be replanted. Portions of the stream and stream banks currently lacking riparian vegetation will be planted with locally occurring riparian species, *e.g.* arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), blue elderberry (*Sambucus mexicana*), California buckeye (*Aesculus californica*), and valley oak (*Quercus lobata*). Willows and valley oaks will be used along the lower portions of the banks. Transitional species, such as California buckeye and blue elderberry, will be planted along the upper banks. A planting plan is being developed that details species mix and planting locations. An irrigation system will be installed to provide supplemental irrigation as needed during the first 3 years post installation or until establishment. A fence with gates will be installed along both sides of the riparian corridor to exclude livestock until plants

become sufficiently established to withstand grazing and to allow controlled grazing thereafter.

Grade Stabilization

Boulder Weirs

Seven low boulder weirs (½ to 1-ton rock) are proposed within the stream to prevent further head cutting. The rock will be sized and placed to interlock and will cover approximately 400 square feet of channel. The weirs will be placed in the channel at locations that exhibit head cutting and where the immediate upstream channel is fairly level in profile. The boulder structures will allow some water to back up, potentially increasing the area of stream channel saturation directly upstream, while still allowing water to flow through the structure.

Culverts

Culvert Replacement

A culvert that currently crosses under the unpaved driveway behind the existing house will be replaced with twin 36 inch diameter culverts to accommodate a 100-year storm event. The current culvert is undersized and as a result has failed to function properly, causing much of the erosion in this area of the creek. Replacing it with an adequately sized culverts will minimize erosion and improve the health of the creek.

Culvert Extension

An existing roadside culvert along Patterson Pass Road is causing erosion on the north bank of the creek. The culvert will be extended approximately 150 linear feet and placed through an existing gully. The culvert extension will outlet to a rock plunge pool dissipater adjacent to the streambed.

Ranch Infrastructure

Fencing

Approximately 1-mile of boundary and pasture fencing (5-strand barbed wire) will be installed to temporarily exclude livestock from created wetlands, springs, and new plantings.

Access Road

The existing ranch access road will be graded and improved with drainrock to reduce erosion and allow vehicle access for monitoring and making repairs in wet weather.

Corral

The Sweet Ranch conservation property will use cattle grazing as one method of range management as identified by the Sweet Ranch Conservation Practices Management Plan. New corrals made from portable fence panels and a chute for working livestock will be installed near the staging area where a dilapidated barn was recently removed.

Water Supply System

An existing spring is located at the eastern end of the project site. The spring is fenced and currently provides water for livestock. A pipeline will be added to the existing developed spring to supply water for the irrigation system that will service the restoration plantings. Additional troughs will also be added to the system. Location of new livestock water facilities will be determined with the acceptance of the Sweet Ranch Conservation Practices Management Plan. The pipeline will follow the existing access road.

Project Schedule

Wetland creation, debris and exotic species removal, grade stabilization, irrigation system installation, and culvert work, will begin August 2010. All plantings and seeding will occur between October 15 and December 31, 2011. Ranch infrastructure improvement will be ongoing and may occur between July 15 and December 31, 2010, or at a later date.

Equipment Used

Types of equipment used for project implementation will include a bulldozer, excavator, bobcat, backhoe, trencher, dump truck, and hand labor.

Locations of Staging Areas/Access Roads

The project staging area is a heavily impacted area located near the home site at the ranch entrance. All equipment will travel from the staging area on an existing ranch road that runs parallel to the drainage on the property. Equipment will be operated only within the project footprint area.

Temporary Erosion Control Measures

Temporary erosion control measures will follow Caltrans standards and specifications and will include measures to prevent loss of soil from runoff and erosion. Measures include the use of rice straw, straw bales, straw wattles, or similar means provided they do not entangle or block escape and dispersal routes of listed animal species. All disturbed areas will be seeded with an appropriate erosion control mixture.

Construction Site Restoration

All temporary ground disturbances, including storage and staging areas and temporary roads. These areas will be re-contoured, if appropriate, and revegetated with seeds and/or cuttings of appropriate native plant species to promote restoration of the area to pre-project conditions. To the maximum extent practicable (*i.e.*, presence of natural lands), topsoil will be removed, cached, and returned to the site according to successful restoration protocols. Loss of soil from run-off or erosion will be prevented using the temporary erosion control measures listed above.

Permanent and Temporary Effects to Habitat for Phases I and II

Permanent Effects

Mitigation activities at Sweet Ranch will result in permanent effects to 0.06-acre of aquatic (stream) habitat and 4.02 acres of upland habitat (*i.e.*, 0.02-acres of streambank/riparian

habitat and 4.0 acres of California annual grassland habitat). Approximately 0.06-acre of streambed will be permanently altered by placement of the seven boulder weirs, reconfiguration of the stream channel in the wet meadow wetland creation area, and culvert replacement. In addition, 0.02-acre of eroded stream bank will be repaired. All of the above permanent effects will result in a net improvement to California tiger salamander and California red-legged frog habitat features on Sweet Ranch.

Temporary Effects

Mitigation activities at Sweet Ranch will result in temporary effects to 0.3-acre of aquatic (stream) habitat and 5.7 acres of upland habitat (i.e., one-acre of California annual grassland habitat and 4.7-acres of streambank/riparian habitat). These habitats will be enhanced and will result in a net improvement in habitat quantity and quality when fully restored.

Table 1. Permanent and Temporary Effects to Habitat for Phases I and II

Habitat	Permanent	Temporary
Aquatic (streambed)	0.06 ac	0.30 ac
Upland (streambank/riparian corridor)	0.02 ac	4.70 ac
Upland (California annual grassland)	4.00 ac	1.00 ac
Total:	4.08 ac	6.00 ac

Proposed Conservation Measures

The Avoidance and Protection Measures in the Biological Opinion and Conference Opinion issued on February 28, 2005 for the Pigeon Pass Curve Realignment Project located in Alameda County, California (Service File No. 1-1-04-F-0115) and all amendments to the biological opinion (Service File No. 1-1-04-F-0116, 1-1-07-F-0159, 1-1-07-F-0268, 81420-2008-F-0214, and 81420-2008-F-0214-2) will be implemented during the proposed work. The boundaries of the Environmentally Sensitive Area will be delineated using flagging.

Maintenance/Monitoring/Reporting

Maintenance, monitoring, and reporting will be the responsibility of Caltrans. Monitoring activities will be documented and monitoring reports will be forwarded to the Service annually for 5 to 10 years, as per the Sweet Ranch Conservation Practices Management Plan. The first monitoring report will be due no later than December 31, one year after completion of Phase II and annually every December 31 for each consecutive monitoring season thereafter.

3. Change the third paragraph of **Avoidance and Protection Measure** on Page 6 from:

The California Department of Transportation will divide the 132 acres of compensation habitat for the San Joaquin kit fox and the California tiger salamander by purchasing 80 credit acres for the California tiger salamander and providing payment for 52 acres into the Service's San Joaquin Kit Fox Fund. The California Department of Transportation is proposing to purchase 80 acres of conservation credits at the Ohlone Conservation Bank.

The California Department of Transportation will pay \$650,000.00 (52 acres x \$12,500/acre) into the San Joaquin Kit Fox Fund.

TO:

The California Department of Transportation will divide the 132 acres of compensation habitat for the San Joaquin kit fox and the California tiger salamander by purchasing 80 credit acres for the California tiger salamander at Ohlone Conservation Bank and reserving 52 acres of the 97.7 acre Sweet Ranch Conservation Easement for San Joaquin kit fox.

4. Add the following paragraph after the first paragraph under the **Effects of the Proposed Action** on Page 44:

Phase I and II activities at the Sweet Ranch property will result in 6 acres of temporary impacts to aquatic (0.3-acre) and 5.7 acres of upland habitat (i.e., 4.7 acres of streambank/riparian habitat and 1.0-acre of California annual grassland habitat), and permanent effects to 0.06-acre of aquatic (stream) habitat and 4.02 acres of upland habitat (i.e., 0.02-acre of streambank/riparian habitat and 4.0-acre of California annual grassland habitat). Phase II activities at the Sweet Ranch property includes equipment access/staging, debris/exotic species removal, excavation, culvert replacement/extension, infrastructure construction, and fill stockpiling. The proposed restoration and enhancement activities may result in the harm or harassment of individual California red-legged frogs and California tiger salamanders during the construction activities. However, the overall habitat quality will be enhanced for all life history stages for both species by improving upland habitat and creating potential breeding habitat.

5. Change the first paragraph under *San Joaquin Kit Fox* of the **Effects of the Proposed Action** on Page 45 from:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species.

TO:

Individual San Joaquin kit foxes may be directly injured or killed by activities that disturb feeding, breeding, and sheltering habitat. The proposed road project would (1) result in the permanent loss of 17.3 acres and the temporary loss of 61.9 acres of San Joaquin kit fox habitat; (2) result in the possible injury and death of an unknown number of San Joaquin kit foxes; (3) result in construction-related harassment to the surviving San Joaquin kit foxes on the site; (4) impede the dispersal of San Joaquin kit foxes through

the site while the action is in progress; (5) increase the likelihood of predation on San Joaquin kit foxes; and (6) fragment and reduce the amount of San Joaquin kit fox habitat in the northern portion of the range of this species. The Phase I activities at the Sweet Ranch property would result in the conversion of 0.09 acres of upland habitat for the San Joaquin kit fox to additional wetland habitat and possible construction-related harassment of an unknown number of San Joaquin kit foxes. The Phase II activities at the Sweet Ranch property would result in the conversion of 4.0 acres of upland habitat for the San Joaquin kit fox to wetland habitat, and the permanent loss of 0.02-acre of riparian habitat as a result of the construction of boulder weirs and the culvert extension. Activities may result in construction related harassment of individual San Joaquin kit fox.

6. Change the first paragraph under *California Tiger Salamander* of the **Effects of the Proposed Action** on Page 53 from:

The proposed Pigeon Pass Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to desiccation, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as raccoons, crows, and ravens, to the sites, who could subsequently prey on the listed amphibian. Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or desiccation (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander.

TO:

The proposed Pigeon Pass Road Project is likely to result in a number of adverse effects to the California tiger salamander. The proposed road project will eliminate and fragment the habitat of the listed amphibian, and increase levels of mortality of the animal during its movements between the breeding ponds and upland habitat. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. Salamanders also could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to desiccation, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during nighttime construction. Edible trash left during or after repair activities could attract predators, such as raccoons, skunks, opossums, crows and ravens, that could subsequently prey on the listed amphibian.

Salamanders also may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or desiccation (Stuart et al. 2001). The increased width of the road and higher levels of vehicle traffic will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds. Individual California tiger salamanders may be directly injured, killed, harmed, and harassed by activities that disturb breeding, migration, dispersal, and aestivation habitat. The proposed road project would result in the permanent loss of 19.1 acres and the temporary loss of approximately 68.0 acres of habitat of the California tiger salamander. Phase I activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland intended to provide breeding habitat for the California tiger salamander. The Phase II activities at the Sweet Ranch property would result in the conversion of 4.0 acres of upland habitat for the California tiger salamander to seasonal wetland habitat intended to function as suitable breeding habitat. A total of 0.08-acre of riparian habitat will be permanently impacted as a result of the construction of boulder weirs and the culvert extension and a total of 6.0 acres of upland habitat will be temporarily impacted. Activities may result in construction related harassment and the death of an unknown number of California tiger salamanders.

7. Change the first paragraph under *California Red-legged Frog* of the **Effects of the Proposed Action** on Page 57 from:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County.

TO:

Individual red-legged frogs may be directly injured, killed, harmed, and harassed by activities that disturb breeding, dispersal, and aestivation habitat. The proposed road project would (1) result in the permanent loss of approximately 1.4 acres and the temporary loss of 3 acres of red-legged frog habitat; (2) result in the death of an unknown number of red-legged frogs; (3) result in construction related harassment, including effects from lights used during nighttime activities, to the surviving red-legged frogs on the site; (4) impede the dispersal of red-legged frogs through the site while the action is in progress; (5) increase the likelihood of predation; (6) fragment and reduce the amount of red-legged frog habitat in Alameda County. Phase 1 activities at the Sweet Ranch property will result in the conversion of upland grassland habitat into an approximately 0.09 acre seep-fed shallow pond and wetland intended to provide breeding habitat for the California red-legged frog. The Phase II activities at the Sweet Ranch property would result in the conversion of 4.0 acres of upland habitat for the California red-legged frog to

seasonal wetland habitat. A total of 0.02-acre of riparian habitat will be permanently impacted as a result of the construction of boulder weirs and the culvert extension and a total of 6.0 acres of upland habitat will be temporarily impacted. Activities may result in construction related harassment and the death of an unknown number of California red-legged frogs.

8. Change the first paragraph under *Vernal Pool Fairy Shrimp* of the **Effects of the Proposed Action** on Page 58 from:

Vernal pool fairy shrimp may be directly injured, killed, harmed, and harassed by activities that damage their vernal pool habitat. The proposed project would directly eliminate 0.84 acre of vernal pools that provides habitat for this species, and fragment and reduce the acreage of the remaining for this listed crustacean habitat located in Alameda County.

TO:

Vernal pool fairy shrimp may be directly injured, killed, harmed, and harassed by activities that damage their vernal pool habitat. The proposed road project would directly eliminate 0.84 acre of vernal pools that provides habitat for this species, and fragment and reduce the acreage of the remaining for this listed crustacean habitat located in Alameda County. The proposed Phase I and II activities at the Sweet Ranch property are not expected to adversely affect the vernal pool fairy shrimp.

9. Change the **Amount or Extent of Take** section beginning on page 62 from:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, the animal may range over a large territory, it is primarily active at night, it is a highly intelligent animal that is often extremely shy around humans, and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17.3 acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when this amphibian is not in breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to located in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment and based on the November 8, 2004, site visit, will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

TO:

The Service expects that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows, may range over a large territory, is primarily

active at night, and is highly intelligent and often extremely shy around humans, making finding an injured or dead individual unlikely. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Therefore, the Service is estimating that all of the San Joaquin kit foxes inhabiting 79.2 acres (17.3 acres of permanent habitat loss, and 61.9 acres of temporary effect to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. In addition, all San Joaquin kit foxes inhabiting the proposed 97.7 acre Sweet Ranch compensation site will be subject to incidental take during the enhancement activities. There is a risk of harm and harassment as a result of the proposed compensation activities, the permanent and temporary loss of habitat; therefore, the Service is authorizing take incidental to the proposed action as the harm and harassment of all San Joaquin kit fox within the Sweet Ranch action area. No injury or mortality of San Joaquin kit fox are anticipated based on the timing of the construction and the proposed conservation measures and terms and conditions of the February 28, 2005 biological opinion. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including Phase I and II activities at the Sweet Ranch property, in the form of harm and harassment of the San Joaquin kit fox caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect, because when this amphibian is not in breeding ponds, or foraging, migrating, or conducting other surface activity, it inhabits the burrows of ground squirrels and other rodents; the burrows may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California tiger salamanders inhabiting 87.1 acres (19.1 acres of permanent habitat loss, and 68 acres of temporary effects to the habitat of this species), as delineated in the biological assessment for the road project, will be subject to incidental take. There is a risk of harm and harassment as a result of the proposed compensation activities, the permanent and temporary loss of habitat, and capture and relocation efforts; therefore, the Service is authorizing take incidental to the proposed action as the capture, harm and harassment of all California tiger salamanders within the Sweet Ranch action area. No injury or mortality of California tiger salamanders are anticipated based on the timing of the construction and the proposed conservation measures and terms and conditions of the February 28, 2005 biological opinion. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including Phase I and II activities at the Sweet Ranch property, in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their

cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all California red-legged frogs inhabiting 4.4 acres (1.4 acres of permanent habitat loss, and 3 acres of temporary effects to the habitat of this species), based on the biological assessment and the November 8, 2004, site visit will be subject to incidental take. There is a risk of harm and harassment as a result of the proposed compensation activities, the permanent and temporary loss of habitat, and capture and relocation efforts; therefore, the Service is authorizing take incidental to the proposed action as the capture, harm and harassment of all California red-legged frogs within the Sweet Ranch action area. No injury or mortality of California red-legged frogs are anticipated based on the timing of the construction and the proposed conservation measures and terms and conditions of the February 28, 2005 biological opinion. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project, including Phase I and II activities at the Sweet Ranch property, in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or nauplai are difficult to locate in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this 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 is estimating that all vernal pool fairy shrimp inhabiting 0.84 acres of vernal pools and seasonal wetlands as delineated in the biological assessment for the road project and based on the November 8, 2004, site visit, will be subject to incidental take. The proposed Phase I and II activities at the Sweet Ranch property are not expected to adversely affect the vernal pool fairy shrimp and will not result in incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Pigeon Pass Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The remainder of the February 28, 2005 Biological and Conference Opinion is unchanged. This concludes reinitiation of the formal consultation on the State Route 84 Pigeon Pass Curve Realignment Project in Alameda County, California. 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, any operations causing such take must cease pending re-initiation.

If you have any questions regarding this amendment to the biological opinion on the State Route 84 Pigeon Pass Curve Realignment Project, please contact Jerry Roe or Ryan Olah at (916) 414-6600.

Sincerely,



for
Susan K. Moore
Field Supervisor

cc:

Margaret Gabil, California Department of Transportation, District 4, Oakland, California
Melissa Escaron, California Department of Fish and Game, Yountville, California



United States Department of the Interior

FISH AND WILDLIFE SERVICE

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



In Reply Refer To:
81420-2008-F-0214-R001

FEB 02 2011

Mr. Jim Richards
Attn: Laura Ivey
Office of Biological Sciences and Permits
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Subject: Reinitiation of Consultation on the State Route 84 Pigeon Pass Curve Realignment Project, Alameda County, California (Caltrans EA 172403)

Dear Mr. Richards:

This is in response to your December 29, 2010, request to reinitiate formal consultation to amend the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project located in Alameda County, California (Service File No.: 1-1-04-F-0115) issued on February 28, 2005. Reinitiation of formal consultation was required based on the issuance of revised critical habitat for the California red-legged frog (*Rana draytonii*), which occurred on March 17, 2010, and may be affected by the implementation of off-site compensation activities at the Sweet Ranch property located approximately 6 miles east of downtown Livermore, Alameda County, California. On November 5, 2007, the Service issued an amendment (Service File No.: 81420-2008-F-0214) for the first phase (Phase I) of the compensation activities on the Sweet Ranch property, and a second amendment (Service File No.: 81420-2008-F-0214-3) was issued on April 27, 2010, for the second phase (Phase II) of the work. This document represents the Service's biological opinion on the effects of the action on the revised designated critical habitat for the threatened California red-legged frog. This amended biological opinion is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act).

This amended biological and conference opinion is based on: (1) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment Project, Southwest of Livermore, Alameda County, California* (Service File No. 1-1-04-F-0115) dated February 28, 2005 prepared by the U.S. Fish and Wildlife Service (Service); (2) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-04-F-0116) dated April 21, 2005; (3) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-07-F-0159) dated May 2, 2007; (4) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 1-1-07-F-0268) dated July 20, 2007; (5) *Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County* (Service File No. 81420-2008-F-0214) dated November 5, 2007; (6)



Amendment to the Biological Opinion and Conference Opinion for the Pigeon Pass Curve Realignment Project, Alameda County, California for the Inclusion of the Installation of an Underground AT&T Phone Line to the Mullenex Residence at 2980 Vallecitos Road, Livermore, California (Service File No. 81420-2008-F-0214-2) dated April 17, 2008; (7) *Reinitiation of Consultation of the Biological Opinion for the State Route 84 Pigeon Pass Curve Realignment Project, Alameda County, California for the Inclusion of Phase II of Mitigation Activities at Sweet Ranch, Livermore, California* (Service File No. 81420-2008-F-0214-3) dated April 27, 2010; (8) a request for an amendment to the Biological Opinion and Conference Opinion from the California Department of Transportation, dated December 29, 2010; (9) correspondence between Alison Caltrans and the Service; and (10) other information available to the Service.

The following changes are made to the February 28, 2005 Biological Opinion:

1. Add the following to the **Consultation History**:

December 30, 2010 The Service received a request dated December 29, 2010 to reinitiate formal consultation to amend the February 28, 2005 Biological Opinion and Conference Opinion to address a change in the designation of critical habitat for the California red-legged frog.

2. Add the following after the **Description of Proposed Action** on Page 9:

Analytical Framework for Jeopardy and Adverse Modification Analyses

Adverse Modification Determination

This biological opinion on the critical habitat for the California red-legged frog does not rely on the regulatory definition of “destruction or adverse modification” of critical habitat at 50 CFR § 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to the critical habitat.

In accordance with policy and regulation, the adverse modification analysis in this Biological Opinion relies on four components: (1) *Status of Critical Habitat* and (2) *Environmental Baseline* of the critical habitat, which evaluates the range wide condition of designated critical habitat for the California red-legged frog in terms of primary constituent elements (PCEs), the factors responsible for that condition, and the intended recovery function of the critical habitat overall; and evaluates the condition of critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (2) *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on PCEs and how that will influence the recovery role of affected critical habitat units; and (3) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the PCEs and how that will influence the recovery role of affected critical habitat units.

For purposes of the adverse modification determination, the effects of the proposed Federal action on California red-legged frog critical habitat are evaluated in the context of the range-wide condition of the critical habitat, taking into account any cumulative effects, to determine if the critical habitat range-wide would remain functional (or would retain the current ability for the PCEs to be functionally established in areas of currently

unsuitable but capable habitat) to serve its intended recovery role for the California red-legged frog.

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

3. Change the **California Red-Legged Frog Critical Habitat** section under the **Status of the Species and Environmental Baseline** on page 35 from:

On March 13, 2001, the final rule determining critical habitat for red-legged frogs was published in the Federal Register (U.S. Fish and Wildlife Service 2001). This rule established 31 critical habitat units based on three primary constituent elements: (a) essential aquatic habitat; (b) associated uplands; and (c) dispersal habitat connecting essential aquatic habitat. In November 2002, the U.S. District Court for the District of Columbia vacated most of the 2001 designation and ordered the Service to publish a new critical habitat proposal. On April 13, 2004, the Service re-proposed 4.1 million acres in 28 California counties as critical habitat for the frog (U.S. Fish and Wildlife Service 2004). This proposed rule basically re-proposes the same areas designated critical habitat in the 2001 final rule.

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, space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, rearing (or development) of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species (U. S. Fish and Wildlife Service 2004).

Due to the complex life history and dispersal capabilities of the California red-legged frog, and the dynamic nature of the environments in which they are found, the primary constituent elements described below are found throughout the watersheds that are proposed as critical habitat. Special management, such as habitat rehabilitation efforts (e.g., removal of nonnative predators), may be necessary in the area designated. The proposed critical habitat for the California red-legged frog provides for breeding and non-breeding habitats and for dispersal between these habitats, as well as allowing for expansion of frog populations vital to the recovery of the subspecies. The proposed critical habitat includes: (a) essential aquatic habitat; (b) associated uplands; and (c) dispersal habitat connecting essential aquatic habitat.

Aquatic habitat is essential for providing space, food, and cover, necessary to sustain all life stages of red-legged frogs. It consists of virtually all low-gradient fresh water bodies, including natural and man-made (e.g., stock) ponds, backwaters within streams and creeks, marshes, lagoons, and dune ponds, except deep lacustrine water habitat (e.g., deep lakes and reservoirs 50 acres or larger in size) inhabited by nonnative predators. The subspecies requires a permanent water source to ensure that aquatic habitat is available year-round. Permanent water sources can include, but are not limited to, ponds, perennial creeks, permanent plunge pools within intermittent creeks, seeps, and springs. Aquatic habitat used for breeding usually has a minimum deep water depth of 20 inches, and

maintains water during the entire tadpole rearing season (at least March through July). During periods of drought, or less-than-average rainfall, these breeding sites may not hold water long enough for individuals to complete metamorphosis, but because they support breeding in wetter years these sites would still be considered essential breeding habitat. Ponds that support a small population of red-legged frogs, but are not surrounded by suitable upland habitat, or are cut off from other breeding ponds or permanent water sources by impassable dispersal barriers, do not have the primary constituent elements for proposed California red-legged frog critical habitat.

To be a primary constituent element for California red-legged frog proposed critical habitat, the aquatic components within the designated boundaries must include two or more breeding sites (as defined above) located within 1.25 miles of each other; at least one of the breeding sites must also be a permanent water source; or, the aquatic component can consist of two or more seasonal breeding sites with a permanent non-breeding water source located within 1.25 miles of each breeding site. California red-legged frogs have been documented to travel 2.25 miles in a virtual straight line migration from non-breeding to breeding habitats (U.S. Fish and Wildlife Service 2001a). In addition, breeding sites must be connected by dispersal habitat connecting essential aquatic habitat, described below.

Associated upland and riparian habitat is essential to maintain California red-legged frog populations associated with essential aquatic habitat. The associated uplands and riparian habitat provide food and shelter sites for California red-legged frogs, and assist in maintaining the integrity of aquatic sites by protecting them from disturbance and supporting the normal functions of the aquatic habitat. Key conditions include the timing, duration, and extent of water moving within the system, filtering capacity, and maintaining the habitat to favor red-legged frogs and discourage the colonization of nonnative species such as bullfrogs. Essential upland habitat consists of all upland areas within 300 feet, or no further than the watershed boundary, of the edge of the ordinary high-water mark of essential aquatic habitat (U.S. Fish and Wildlife Service 2001a).

Essential dispersal habitat provides connectivity among California red-legged frog breeding habitat (and associated upland) patches. While frogs can pass many obstacles, and do not require a particular type of habitat for dispersal, the habitat connecting essential breeding locations and other aquatic habitat must be free of barriers (e.g., a physical or biological feature that prevents frogs from dispersing beyond the feature) and at least 300 feet wide. Essential dispersal habitat consists of all upland and wetland habitat free of barriers that connects two or more patches of essential breeding habitat within 1.25 miles of one another. Dispersal barriers include heavily traveled roads (an average of 30 cars per hour from 10:00 p.m. to 4:00 a.m.) that possess no bridges or culverts; moderate to high density urban or industrial developments; and large reservoirs more than 50 acres in size. Agricultural lands such as row crops, orchards, vineyards, and pastures do not constitute barriers to California red-legged frog dispersal.

Dispersal habitat connecting essential aquatic habitat. Essential dispersal habitat provides connectivity among red-legged frog breeding habitat (and associated upland) patches. While frogs can pass many obstacles, and do not require a particular type of habitat for dispersal, the habitat connecting essential breeding locations and other aquatic habitat must be free of barriers (e.g., a physical or biological feature that prevents frogs from dispersing beyond the feature) and at least 300 feet wide. Essential dispersal habitat consists of all upland and wetland habitat free of barriers that connects two or more patches of essential breeding habitat within 1.25 miles of one another. Dispersal barriers

include heavily traveled roads (an average of 30 cars per hour from 10:00 p.m. to 4:00 a.m.) that possess no bridges or culverts; moderate to high density urban or industrial developments; and large reservoirs more than 50 acres in size. Agricultural lands such as row crops, orchards, vineyards, and pastures do not constitute barriers to red-legged frog dispersal.

The Pigeon Pass Project occurs within the East Bay-Diablo Range unit (Unit 15), which consists of watersheds within Contra Costa, Alameda, San Joaquin, Santa Clara, Stanislaus, San Benito, Merced, and Fresno counties. The boundary of Unit 15 encompasses approximately 1.05 million acres, of which approximately 87 percent is privately owned. The remaining 13 percent is managed, in part, by various Federal, State, and local land and water management agencies. Because essential aquatic habitat, associated uplands, and essential dispersal habitat has not been widely mapped in the unit, the Service can not accurately estimate the area within the unit that supports primary constituent elements. However, due to the presence of high use roads and developed areas as well as substantial areas without permanent water, we anticipate that the effective area of Unit 15 will be considerably less than 1.05 million acres.

Unit 15 has been affected by activities that destroy essential aquatic and upland habitats, and dispersal habitats providing connectivity between subpopulations. Degradation and loss of these habitats have occurred through urbanization, mining, inappropriate management of grazing, recreation, invasion of nonnative plants, impoundments, water diversions, degraded water quality, and introduced predators.

The action area is relatively undeveloped, and it contains State Route 84, Ruby Hills and Vineyard Estates developments, and several ranches. The surrounding habitat includes several vegetation communities, including valley oak woodland, annual non-native grassland, seasonally wetted areas with associated vegetation, and ponds. A 60-acre California red-legged frog/California tiger salamander compensation site for the Ruby Hills/Vineyard Estates consists of a series of artificial ponds connected by drainages, and the surrounding upland habitat. As described in the Biological Assessment, essentially all undeveloped lands on and adjacent to the project site contain the constituent elements of proposed California red-legged frog critical habitat, including essential aquatic habitat, associated uplands, and essential dispersal habitat.

TO:

The Service designated critical habitat for the California red-legged frog on April 13, 2006 (71 FR 19244) and a revised designation to the critical habitat was published on March 17, 2010 (75 FR 12816). At this time, the Service recognized the taxonomic change from *Rana aurora draytonii* to *Rana draytonii* (Shaffer *et al.* 2010). 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, or dispersal; and
5. Generally, habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

The primary constituent elements defined for the California red-legged frog was derived from its biological needs. The area designated as revised critical habitat provides aquatic habitat for breeding and non-breeding activities and upland habitat for shelter, foraging, predator avoidance, and dispersal across its range. The primary constituent elements and, therefore, the resulting physical and biological features essential for the conservation of the species were determined from studies of California red-legged frog ecology. Based on the above needs and our current knowledge of the life history, biology, and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, the Service determined that the primary constituent elements essential to the conservation of the California red-legged frog are:

1. *Aquatic Breeding Habitat.* Standing bodies of fresh water (with salinities less than 7.0 parts per thousand), including: natural and manmade (e.g., stock) ponds, slow-moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years.
2. *Non-Breeding Aquatic Habitat.* Freshwater and wetted riparian habitats, as described above, that may not hold water long enough for the subspecies to hatch and complete its aquatic life cycle but that do provide for shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult California red-legged frogs. Other wetland habitats that would be considered to meet these elements include, but are not limited to: plunge pools within intermittent creeks; seeps; quiet water refugia during high water flows; and springs of sufficient flow to withstand the summer dry period.
3. *Upland Habitat.* Upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of 1 mi in most cases and comprised of various vegetational series such as grasslands, woodlands, wetland, or riparian plant species that provides the frog shelter, forage, and predator avoidance. Upland features are also essential in that they are needed to maintain the hydrologic, geographic, topographic, ecological, and edaphic features that support and surround the wetland or riparian habitat. These upland features contribute to the filling and drying of the wetland or riparian habitat and are responsible for maintaining suitable periods of pool inundation for larval frogs and their food sources, and provide breeding, non-breeding, feeding, and sheltering habitat for juvenile and adult frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator

avoidance). Upland habitat should include structural features such as boulders, rocks and organic debris (e.g., downed trees, logs), as well as small mammal burrows and moist leaf litter.

4. *Dispersal Habitat.* Accessible upland or riparian dispersal habitat within designated units and between occupied locations within a minimum of 1 mile of each other and that allows for movement between such sites. Dispersal habitat includes various natural habitats and altered habitats such as agricultural fields, which do not contain barriers (e.g., heavily traveled road without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large reservoirs over 50 acres in size, or other areas that do not contain those features identified in primary constituent elements 1, 2, or 3 as essential to the conservation of the subspecies.

With the revised designation of critical habitat, the Service intends to conserve the geographic areas containing the physical and biological features that are essential to the conservation of the species, through the identification of the appropriate quantity and spatial arrangement of the 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. Please refer to the final designation of critical habitat for California red-legged frog for additional information (75 FR 12816).

4. Add the following after the last paragraph under the **California Red-Legged Frog Critical Habitat** section under the **Status of the Species and Environmental Baseline** on page 38:

The 97.7-acre Sweet Ranch off-site compensation property is located entirely within the Arroyo Valle critical habitat unit (ALA-2) on Patterson Pass Road immediately east of the intersection with Cross Road. This unit comprises 153,624 acres; the portion within the action area and subject to ground disturbance totals approximately 10.7 acres, which represents less than one-tenth of one percent of the total unit acreage. This unit extends from Interstate 580 in the Altamont Pass east of the City of Livermore southeast into San Joaquin County and southwest into Santa Clara County toward Arroyo Hondo and Calaveras Reservoir. Unit ALA-2 contains the features that are essential for the conservation of the species. The unit also contains aquatic habitat for breeding and non-breeding activities (PCE 1 and PCE 2) and upland habitat for foraging and dispersal activities (PCE 3 and PCE 4). The unit contains high-quality permanent and ephemeral aquatic habitats suitable for breeding and upland areas for dispersal, shelter, and foraging activities.

The Sweet Ranch compensation site is privately-held Alameda County ranch land. Preservation and enhancement through a conservation easement and habitat enhancement is valuable progress toward effective management of critical habitat for the California red-legged frog within subunit ALA-1B, a majority of which is privately held. The Sweet Ranch site contains two of the four PCE's: non-breeding aquatic (PCE 2) and upland habitat (PCE 3). The current compensation project, including creation and restoration of 4 acres of seasonal wetlands, restoration of 4,810 linear feet of riparian corridor, and improvement to ranch facilities (i.e., vehicle access, culvert repair and replacement, and cattle fencing) will provide beneficial improvements to the primary constituent elements (PCEs) of California red-legged frog habitat at the site. The proposed compensation

activities for the Pigeon Pass curve realignment will enhance two primary constituent elements (PCE 2 and 3) and improve the value of the 97.7-acre Sweet Ranch parcel.

1. *Non-Breeding Aquatic Habitat (PCE 2)*. Non-breeding aquatic habitat at the site includes several existing features that will not be negatively impacted by the compensation activities, and additional improvements to this PCE through creation and restoration activities. The restoration of the riparian corridor and creation of seasonal wetlands will increase and improve the aquatic and riparian non-breeding habitat (PCE 2) at Sweet Ranch for California red-legged frog by providing juvenile and adult individuals with shelter, foraging, predator avoidance, and aquatic dispersal options. Those features include the following:
 - a. A stock pond was constructed during Phase I of the compensation activities in 2007 measuring approximately 25 x 50 feet and fed by perennial spring that provides approximately 6,000 gallons per day. The pond was built to provide breeding habitat for California tiger salamander and non-breeding aquatic habitat for the California red-legged frog. A single California red-legged frog was observed at the pond following its completion (Caltrans 2010).
 - b. A series of shallow terraces lined with a geosynthetic clay-liner will be created that will allow retention of surface water runoff from the approximately 45-acre watershed. Because the existing grade of the basin is steeply sloped, a stepped/terraced design will be used to increase water retention time so that soils within the terraces will remain saturated for a period of 14 days or more. The terraces will be seeded and planted with native vegetation, and approximately one acre of seasonal wetland will be created. Seeding and planting for erosion control and wetland vegetation will be included in the compensation activities.
 - c. A wet meadow will be created in a gently sloping field at the western reach of the intermittent stream on the property. This meadow will be created by re-grading the field and existing channel, and constructing a series of four terraces separated by earthen berms. Rock-lined drop structures will be installed as spillways between the terraced, ponding areas. Wetland areas will be seeded and planted with appropriate native plants. Approximately 3 acres of seasonal wetland will be created at this location.
 - d. An existing culvert upstream of the riparian improvements will be repaired to reduce an ongoing erosion problem that may result in increased sediment loads within the creek. Extension of the downdrain portion of the culvert and installation of rock slope protection to reduce scouring at the outfall will reduce the potential for erosion.
2. *Upland Habitat (PCE 3)*. Upland habitat at Sweet Ranch consists of rolling grasslands comprising the majority of the 97.7 acre site. Compensation activities will convert 4 acres of upland (PCE 3) to seasonal wetland (PCE 2). The creation of seasonal wetlands within a larger extent of uplands will enhance the utilization of the remaining uplands by providing a greater diversity of primary constituent elements onsite. Improvements to upland habitat include:
 - a. Enhancement of approximately 4,810 linear feet of stream and stream bank which currently lack native hydrophytic vegetation. This area will be

replanted with locally occurring riparian species. Revegetation is projected to increase water retention in the stream by reducing erosion and evaporation, and to provide a more complex vegetative cover that will enhance both predator avoidance and foraging opportunities for the California red-legged frog.

- b. The upland PCE also includes transitional margins between the uplands and aquatic or riparian features. The 4 acres of created wetlands and the enhanced riparian corridor will include planting of native vegetation, and the improvement in vegetative cover in contrast to the existing annual, non-native grasses may provide improved conditions for foraging.
 - c. Boulder weirs to be installed within the riparian corridor are designed to control the erosive force of the seasonal water flow. These features will provide rocky, shaded sub-surface refugia.
5. Add the following after the first paragraph under **California Red-Legged Frog Critical Habitat** of the **Effects of the Proposed Action** on Page 58:

The compensation activities at the 97.7-acre Sweet Ranch will result in the conversion of 4 acres of upland habitat (PCE 3) to non-breeding aquatic habitat (PCE 2). Improvements will comprise restoration of 4,810 linear feet of streambank habitat and 4.7 acres of mixed riparian habitat, restoration of 2.4 acres of bed and bank and the creation of 4.0 acres of seasonal wetlands.

Construction of the aquatic habitat, upland enhancements and improvements to ranch infrastructure will result in permanent effects to 0.06-acre of aquatic (stream) habitat and 4.02 acres of upland habitat (i.e., 0.02-acres of streambank/riparian habitat and 4.0 acres of California annual grassland habitat). Approximately 0.06-acre of streambed will be permanently altered by placement of the seven boulder weirs, reconfiguration of the stream channel in the wet meadow wetland creation area, and culvert replacement. An additional 0.02-acre of eroded stream bank will be repaired. Compensation activities will result in temporary effects to 0.3-acre of aquatic (stream) habitat and 5.7 acres of upland habitat (i.e., one-acre of California annual grassland habitat and 4.7-acres of streambank/riparian habitat) (Table 1). All of the above permanent effects will result in a net improvement to California red-legged frog critical habitat features on Sweet Ranch.

Table 1. Permanent and Temporary Effects to Habitat for Phases I and II

Habitat	Permanent	Temporary
Aquatic (streambed)	0.06 ac	0.30 ac
Upland (streambank/riparian corridor)	0.02 ac	4.70 ac
Upland (California annual grassland)	4.00 ac	1.00 ac
Total:	4.08 ac	6.00 ac

6. Change the **Conclusion** on Page 61 from:

After reviewing the current status of the vernal pool fairy shrimp, California tiger salamander, California red-legged frog, and the San Joaquin kit fox, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the Pigeon Pass Project is not likely to

jeopardize the continued existence of these four listed species. Critical habitat for the San Joaquin kit fox has not been proposed or designated, therefore, none will be affected by the proposed project. Critical habitat for the vernal pool fairy has been designated, however none is located in the action area, and therefore none will be affected by the proposed project. Critical habitat has been proposed for the California tiger and the California red-legged frog, however none will be adversely modified or destroyed. The Service reached the conclusion on the effects on the proposed critical habitat of the California red-legged frog and the California tiger salamander because the effects of the project will be offset by the conservation measures in the project description, including the successful restoration of areas subject to the temporary effects of cut and fill to pre-project conditions.

TO:

After reviewing the current status of the vernal pool fairy shrimp, California tiger salamander, California red-legged frog, and the San Joaquin kit fox, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the Pigeon Pass Project is not likely to jeopardize the continued existence of these four listed species. Critical habitat for the San Joaquin kit fox has not been proposed or designated, therefore, none will be affected by the proposed project. Critical habitat for the vernal pool fairy has been designated, however none is located in the action area, and therefore none will be affected by the proposed project. Critical habitat has been designated for the California tiger salamander; however none will be affected by the proposed action. Critical habitat for the California red-legged frog will not be adversely modified or destroyed, or prevent the critical habitat from sustaining its role in the conservation and recovery of the species. The proposed action will enhance the value of the critical habitat for the California red-legged frog.

This concludes the reinitiation of formal consultation on the proposed State Route 84 Pigeon Pass Curve Realignment Project in Alameda County, California. 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, including work outside of the project footprint analyzed in this opinion and including vehicle parking, staging, lay down areas, and access roads; (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 including use of vehicle parking, staging, lay down areas, and access roads; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have questions concerning this opinion on proposed State Route 84 Pigeon Pass Curve Realignment Project, Alameda County, California, please contact Jerry Roe or Ryan Olah at the letterhead address or at (916) 414-6600.

Sincerely,

A handwritten signature in black ink, appearing to read "Susan K. Moore". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

SKM Susan K. Moore
Field Supervisor

cc:

Margaret Gabil, California Department of Transportation, District 4, Oakland, California
Melissa Escaron, California Department of Fish and Game, Yountville, California

LITERATURE CITED

- Shaffer, H. B., G.M. Fellers, S. R. Voss, C. Oliver, and G.B. Pauley. 2010. Species Boundaries, Phylogeography, and Conservation Genetics of the Red-Legged Frog (*Rana aurora/draytonii*) Complex. *Molecular Ecology* 13: 2667-2677.
- U. S. Fish and Wildlife Service. 2010. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for California Red-Legged Frog; Final Rule. **Federal Register** 75(51):12816-12959.

DEPARTMENT OF THE ARMY PERMIT

PERMITTEE: California Department of Transportation

PERMIT NO.: 28771S

ISSUING OFFICE: San Francisco District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate District or Division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below:

PROJECT DESCRIPTION:

You are authorized to discharge into jurisdictional Waters of the U.S. including wetlands approximately 11 cubic yards of rock slope protection (RSP) and 4075 cubic yards of clean, granular fill material (from on-site sources). The above mentioned discharge material will fill 1.87 acres of wetlands and 0.34 acres of others waters of the U.S. that are associated with two unnamed drainages in the Vallecitos Hills adjacent to SR 84 southwest of Livermore. All jurisdictional sites where fill material will be discharged are illustrated on the maps shown in Appendix A of the *Pigeon Pass Realignment Project, Individual Permit Application*, dated January 2006.

The project will realign and widen a portion of State Route (SR) 84 through Pigeon Pass also known as the Vallecitos Hills, located southwest of Livermore in Alameda County, California. It begins near the intersection of Sabel Drive / Kalthoff Common with SR 84 and continues southwesterly to about 0.7 mile east of the SR 84 junction at Vallecitos Atomic Laboratory Road. The widening is being constructed to accommodate a passing lane for the uphill traffic in both the east and west bound direction. The project will also correct the existing vertical and horizontal alignment which in the existing highway is below standard and unsafe. This construction is needed for both safety and congestion relive purposes.

PROJECT LOCATION:

The project is located southwest of Livermore in Alameda County, California on SR 84 in the Vallecitos Hills. This section of highway is also known as Pigeon Pass.

PERMIT CONDITIONS:

GENERAL CONDITIONS:

1. The time limit for completing the work authorized ends **October 15, 2011**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should

you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

7. You understand and agree that, if future operations by the United States require the removal, relocation or other alteration of the structure or work authorized herein, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, you will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

SPECIAL CONDITIONS:

1. This Corps permit does not authorize you to take an endangered species. In order to legally take a listed species, you must have a separate authorization under the Endangered Species Act (ESA) (e.g., an ESA Section 10 permit or a Biological Opinion (BO) under ESA Section 7 with "incidental take" provisions with which you must comply). The enclosed U.S. Fish and Wildlife Service (USFWS) *Biological Opinion and Conference Opinion on the Proposed Pigeon Pass Curve Realignment, Southwest of Livermore, Alameda County, California* (BO), pages 63 – 74, dated February 25, 2005 contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the BO. Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take authorized by the attached BO, whose terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the BO, where a take of the listed species occurs, would constitute an unauthorized take and it would also constitute non-compliance with this Corps permit. The USFWS is the appropriate authority to determine compliance with the terms and conditions of its BO and with the ESA.

2. Caltrans shall adhere to the conditions of the RWQCB Clean Water Act 401 Certification dated May 18, 2006.

3. Caltrans will create on the project site at a ratio of 1:1, a minimal of 0.65 acres of seasonal wetland to offset impacts to .65 acres of impacts to seasonal wetlands. The on site wetlands will be created approximately as shown in Figures 2 – 7 in the *Pigeon Pass Realignment Project Addendum to Individual Permit Application*, dated February 2006 unless Caltrans gets an approved modification from the Corps.

4. Caltrans will create on the project site at a 1:1 ratio a minimal of 0.18 acres of ephemeral creek channel to offset impacts to 0.18 acres of ephemeral creek channel. The on site channels will be created approximately as shown in Figures 2 – 7 in the *Pigeon Pass Realignment Project Addendum to Individual Permit Application*, dated February 2006 unless Caltrans gets an approved modification from the Corps.

5. Caltrans will create 1.61 acres of new wetland on the Sweet Ranch site **before the start of construction on the Pigeon Pass Realignment Project.** These wetland areas will be created as described in the preliminary Sweet Ranch mitigation proposal or as modified with Corps approval to meet Corps requirements. This mitigation is described in a small document written by Caltrans entitled *Sweet Ranch Mitigation Site, Off Site Mitigation Proposal for Impacts at Pigeon Pass for Army Corps Jurisdictional Waters of the U.S. including wetlands*, dated May 19, 2006.

6. Appropriate best management practices (BMPs) shall be implemented throughout the project site to minimize erosion and reduce sedimentation into adjacent waterways. BMPs shall include, but not necessarily be limited to, placement of silt fencing and fiber rolls, or hay bales to all exposed slopes adjacent to waterways to intercept sediments and stabilize all exposed areas. Erosion control blankets and/or seeding with appropriate seed mixes will be used at project completion to control erosion on all disturbed sites.

7. The seasonal pond at the top of the saddle east of SR 84 by Station 68+00 called Wetland #1F shall not be filled as shown in figure 1 in the *Addendum to Individual Permit Application* dated February 2006 until the pond has dried up for the season or is at its low for the season.

8. The pond at Station 60+50 known as Wetland # 3B, shall not be filled as shown in figure 1 in the *Addendum to Individual Permit Application* dated February 2006 until it has dried up for the season or is at its low for the season.

9. Work in the all wetlands and waters within the project will occur after the sites are dry for the season and will be completed for the season by October 15th.

10. Before project implementation, Caltrans shall provide the Corps with project plans showing all Environmentally Sensitive Areas (ESA) that will be clearly marked on the ground during construction areas.

11. Caltrans shall provide the Corps with detailed **pre-construction maps** or aerial photos of all off site mitigation required by the Corps showing existing waters of the U.S. including wetlands. All jurisdictional waters of the U.S. including wetlands shall be delineated by the Corps.

12. Caltrans shall provide the Corps with detailed **post-construction maps** or aerial photos of all off site mitigation required by the Corps showing existing waters of the U.S. including wetlands. All jurisdictional waters of the U.S. including wetlands shall be re-delineated by the Corps to demonstrate the increases created for the mitigation.

13. Caltrans shall provide the Corps with a set of Landscape Erosion Control and Planting Plans for the project areas and mitigation sites when such plans become available.

14. Caltrans shall submit a Final Mitigation, Monitoring, and Maintenance Plan to the Corps. The plan should include planting plans and details of all on-site and off-site mitigation, such as designs and construction drawings for in-stream structures, pond reconstruction, grading, planting, irrigation plans, and all other information, as appropriate. The plan should also include approximate completion dates, performance standards and success criteria.

All mitigation sites shall be monitored at least once annually and monitoring shall continue for 5 years or longer until the Corps determines that the mitigation is successful. A yearly monitoring report shall be sent to the San Francisco Corps Office by December 31 each season. The reports should also include recommendations for remedial action as needed.

The Final Mitigation, Monitoring, and Maintenance Plan may be amended subject to a review and approval by the Corps.

15. Provide the Corps with the proposed mitigation locations, copies of the proposed final conservation easements, or other legal documents that identify, among other things, the entity or entities that will hold those easements after the monitoring period is completed and how the mitigation sites will be preserved in perpetuity.

FURTHER INFORMATION:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

- Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)
- Section 404 of the Clean Water Act (33 U.S.C. Section 1344).
- Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization:

- a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.
- b. This permit does not grant any property rights or exclusive privileges.
- c. This permit does not authorize any injury to the property or rights of others.
- d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability: In issuing this permit, the Federal Government does not assume any liability for the following:

- a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
- b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
- c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
- d. Design or construction deficiencies associated with the permitted work.
- e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

DEPARTMENT OF FISH AND GAME

CENTRAL COAST REGION

(707) 944-5520

Mailing address:

POST OFFICE BOX 47

YOUNTVILLE CALIFORNIA 94599

Street address:

7329 SILVERADO TRAIL

NAPA CALIFORNIA 94558



June 19, 2006

Notification Number: 1600-2006-0059-3

Ron Kiaaina / California Department of Transportation
Post Office Box 23660
Oakland, CA 95623-0660

1602 LAKE AND STREAMBED ALTERATION AGREEMENT

This agreement is issued by the Department of Fish and Game pursuant to Division 2, Chapter 6 of the California Fish and Game Code:

WHEREAS, the applicant Ron Kiaaina / California Department of Transportation, hereafter called the Operator, submitted a signed NOTIFICATION proposing to substantially divert or obstruct the natural flow of, or substantially change the bed, channel, or bank of, or use material from the streambed or lake of the following water: various streams, located near State Route 84, in the County of Alameda, State of California; and

WHEREAS, the Department has determined that such operations may substantially adversely affect existing fish and wildlife resources including water quality, hydrology, aquatic or terrestrial plant or animal species; and

WHEREAS, the project has undergone the appropriate review under the California Environmental Quality Act; and

WHEREAS, the Operator shall undertake the project as proposed in the signed PROJECT DESCRIPTION and PROJECT CONDITIONS (attached). If the Operator changes the project from that described in the PROJECT DESCRIPTION and does not include the PROJECT CONDITIONS, this agreement is no longer valid; and

WHEREAS, the agreement shall expire on December 31, 2010; with the work to occur between May 1 and October 31; and

WHEREAS, nothing in this agreement authorizes the Operator to trespass on any land or property, nor does it relieve the Operator of the responsibility for compliance with applicable Federal, State, or local laws or ordinances. Placement, or removal, of any material below the level of ordinary high water may come under the jurisdiction of the U. S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act;

THEREFORE, the Operator may proceed with the project as described in the PROJECT DESCRIPTION and PROJECT CONDITIONS. A copy of this agreement, with attached PROJECT DESCRIPTION and PROJECT CONDITIONS, shall be provided to contractors and subcontractors and shall be in their possession at the work site.

Failure to comply with all conditions of this agreement may result in legal action.

This agreement is approved by:

A handwritten signature in black ink, appearing to read "R. W. Floerke".

Robert W. Floerke
Regional Manager
Central Coast Region

cc: Warden Garrett
Lieutenant Christensen

DEPARTMENT OF FISH AND GAME

CENTRAL COAST REGION

(707) 944-5520

Mailing address:

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YOUNTVILLE, CALIFORNIA 94599

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NAPA, CALIFORNIA 94558



Notification Number: **1600-2006-0059-3**
Pigeon Pass, Alameda County

Ron Kiaaina / California Department of Transportation
Post Office Box 23660
Oakland, CA 95623-0660

PROJECT DESCRIPTION and PROJECT CONDITIONS**Description**

The project is located southwest of Livermore on SR 84 in Alameda County beginning near the Ruby Hills Drive/Kalthoff and SR 84 intersection and continues west to Post Mile 23.0. The project is necessary to correct existing horizontal and vertical alignment deficiencies. The purpose of the project is to improve safety and traffic operations by realigning and adding truck climbing lanes through the Vallecitos Hills/Pigeon Pass area. Below is a description of each project identified by and described by Caltrans.

Project 1 (Water 1A)

This project affects an unnamed ephemeral creek (labeled as Water 1A on the maps) which runs parallel to State Route 84 (SR 84) on the south side. This water is a tributary of Arroyo del Valle. The drainage in this area is shallow and characterized by indistinct banks vegetated with nonnative annual grasses typical for the area. See the attached habitat description for annual grassland. The area is devoid of a woody riparian overstory.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 63 square feet (0.001 ac; 10 linear ft) and associated temporary impacts totaling approximately 528 sq. ft (0.01 ac).

Access to the location will be via the adjacent existing highway or by driving across the upland. No access roads within the streambed are planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area.

Project 2 (Wetland 1A)

This project affects a seasonal wetland (labeled as Wetland 1A on the maps), which is tributary to the Arroyo del Valle. In the past, check dams made of rock were placed within the ephemeral creek (Water 1A) at this location. This has created a bottleneck, allowing wetland characteristics to evolve within the creek. The wetland is heavily vegetated with cattails. The area is devoid of woody riparian overstory.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 7,866 sq ft (0.18 ac) and associated temporary impacts totaling approximately 1,159 sq ft (0.03 ac). Three natural bottom ponds will be constructed at the toe of slope of the new alignment from approximately station number 80+40 to 82+40 (see maps) to direct the upstream flow. A ditch will connect the three ponds. The ditches will be lined with rock slope protection (RSP) at the outfalls of each pond to slow water velocity. Construction of the pond and ditch complex, as opposed to a straight channel, will reduce velocity through the area.

Access to the location will be via the adjacent existing highway or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area, as well as the newly created ponds.

Project 3 (Water 1B)

This ephemeral drainage (labeled as Water 1B on the map) is located upstream of the Wetland 1A along the southern edge of SR 84, and is tributary to Arroyo del Valle. It is a heavily incised, oak riparian stream corridor with steep banks leading to the channel bed at the toe of slope of SR 84. This drainage is connected to the adjacent, upstream wetland 1C by a culvert that passes under a residential driveway.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 4,081 sq ft (0.09 ac; 895 linear ft) and associated temporary impacts totaling approximately 982 sq ft (0.02 ac). The temporary impacts include the installation of a temporary culvert which will provide access between the east and west sides of the creek. Construction activities will also result in 0.36 acre of temporary impacts, and 1.46 acre of permanent impacts to oak riparian habitat.

Access to the location will be via the adjacent existing highway, driveways, or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, the temporary culvert will be removed and the ground recontoured to its pre-project condition. Caltrans proposes to reseed the temporarily disturbed area and to replant the riparian corridor areas.

Project 4 (Wetland 1B)

This is a 0.01 acre seasonal wetland, labeled as Wetland 1B on the map, within the Water 1 system. It forms at the inlet of a culvert that passes under SR 84 and can best be described as a vegetated channel. The channel is devoid of woody riparian overstory.

Placement of fill or construction of the new alignment will result in permanent impacts totaling approximately 55 sq ft (0.001 ac) and associated temporary impacts totaling approximately 13 sq ft (0.0003 ac). Access to the location will be via the adjacent existing highway.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area.

Project 5 (Wetland 1C)

This is a 0.67 acre seasonal wetland (labeled as Wetland 1C on the map) south of SR 84. This wetland is a combination of flow from Water 1C and the nearby hills. It can best be described as a combination of swale and wet meadow. There is a small area of oak riparian habitat associated with the west end of this wetland. The riparian habitat is part of the riparian corridor that runs along Water 1C described below.

Placement of fill for the construction of the new alignment and installation of a 48-inch culvert and a 12-inch culvert to facilitate drainage under the new alignment will result in permanent impacts to wetlands totaling approximately 18,297 sq ft (0.42 ac) and associated temporary impacts totaling approximately 4,150 sq ft (0.10 ac). Construction activities will also result in 0.12 acre of temporary impacts to riparian habitat.

Access to the location will be via the adjacent existing highway or a farm road.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed area.

Project 6 (Water 1C)

This heavily incised, ephemeral drainage (labeled as Water 1C on the map) receives flow from the bermed Wetland 1D via a spillway/culvert. This drainage, which has an associated dense oak

riparian corridor, discharges into the downstream Wetland 1C. It is a tributary of Arroyo del Valle.

There will be no impacts to the bed and bank of this drainage; however, there is the potential to temporarily impact 0.15 acre of the outer edge of the oak riparian habitat due to construction equipment and work activities associated with adjacent roadwork.

Access to the location will be through the adjacent upland areas. No access roads within the stream zone are planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed riparian area.

Wetland 1D

This 0.35 acre seasonal wetland (labeled as Wetland 1D on the map) is south of SR 84. It is fed by Water 1D and drained by Water 1C. A wet meadow-type wetland has formed where Water 1D has braided out in this area behind a man-made berm. This area will be avoided during the construction therefore there will be no impacts.

Project 7 (Water 1D)

This ephemeral drainage (labeled as Water 1D) is located upstream of Wetland 1D and flows parallel to SR 84. This segment of the Water 1 system receives drainage from the upstream Wetland 1E, is moderately incised and has a dense oak/willow riparian habitat. It is a tributary of Arroyo del Valle.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 5,952 sq ft (0.14 ac; 917 linear feet) and associated temporary impacts totaling approximately 718 sq ft (0.02 ac). Work activities will also result in 0.24 acre of temporary impacts and 1.18 acre of permanent impacts to riparian habitat. The creek channel will be realigned from its existing location to the north toe of the new slope from approximately station numbers 69+65 to 72+80. This new channel will have a combination of natural bottom and some rock protection in areas where the additional erosion protection is needed, with rock weirs placed at appropriate locations along the new channel to create seasonally ponded wetland areas to mitigate impacts to Wetlands 1C, 1D, and 1E.

Access to the location will be via the adjacent existing highway or upland areas. There are no access roads within the stream zone planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed waters and riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the previously submitted Revegetation Plan. The recreated channel will, at minimum, be seeded with the wetland/waters species proposed in the submitted Revegetation Plan. If conditions are suitable to support riparian vegetation after construction, the area will also be augmented with riparian species proposed in the Revegetation Plan.

Project 8 (Wetland 1E)

This 0.12 acre seasonal wetland (labeled as Wetland 1E) is located above the origin of Water 1E in a low-lying area that slopes towards Water 1D. It receives water from sheet flow runoff from the adjacent hills and from a culvert under SR 84. Under heavy storm conditions, it has the potential to receive water from Wetland 1F. It is vegetated with wetland grasses and has no woody overstory.

This wetland will be completely filled by the construction project. Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 5,365 sq ft (0.12 ac).

Project 9 (Water 1E)

This drainage, labeled as Water 1E on the map, connects the headwaters Wetland 1F with all downstream jurisdictional features. It is a very shallow, indistinct drainage that has no associated riparian overstory and is vegetated only with nonnative annual grasses. It is a tributary of Arroyo del Valle.

This drainage will be completely filled by the construction project. Placement of fill necessary to construct the new alignment will result in permanent impacts totaling approximately 557 sq ft (0.01 ac; 277 linear ft). This drainage area will be recreated and vegetated as described in the Project 8, as the two projects are connected and will be similarly impacted.

Project 10 (Wetland 1F)

This large 1.2 acre seasonal wetland (labeled as Wetland 1F on the maps) forms in a low area immediately adjacent to the existing roadway on the east side of the Pigeon Pass saddle, and accepts roadway runoff and sheet flow from the surrounding uplands. Wet season observation, topography, and drainage patterns indicate that this system is not typically hydrologically connected to a jurisdictional water body, except possibly during heavy storm conditions, when it may overflow into Wetland 1E. The edges are populated with wetland plants such as *Eleocharis* sp., *Carex* sp., and *Juncus* sp. during the growing season with open water comprising the remaining inner portion. The area is devoid of a riparian overstory.

Placement of fill necessary to construct the new alignment will result in permanent impacts to wetlands totaling approximately 33,971 sq ft (0.78 ac) and associated temporary impacts totaling approximately 5,799 sq ft (0.13 ac).

Access to the location will be via the adjacent existing highway, driveway, or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to reseed the temporarily disturbed area.

Project 11 (Wetland 2)

This 0.07 acre wetland (labeled as Wetland 2 on the map) is the result of a spring at the beginning of a seasonal drainage, at the top of a hill. A small plateau at the spring creates an area for water to saturate the ground, and sometimes pool, before it overflows down the hill during the wet season. The wetland is vegetated with *Juncus* sp., *Eleocharis* sp., *Cyperus* sp., and *Rumex* sp. This wetland will be completely filled by the new alignment. Placement of fill necessary to construct the new alignment and installation of a 750 mm (29.5 inch) culvert to facilitate drainage will result in permanent impacts to wetlands totaling approximately 3,162 sq ft (0.07 ac).

Project 12 (Wetland 3A)

This 0.06 acre seasonal wetland (labeled as Wetland 3A on the map) is partially within a creek bed and a backwater area of a creek (Water 2). It is sparsely vegetated with wetland plants such as *Rumex* sp., *Cyperus* sp., *Eleocharis* sp. and *Juncus* sp., but is devoid of a riparian overstory. This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill necessary to construct the new alignment and installation of a 28-inch culvert to facilitate drainage will result in permanent impacts to wetlands totaling approximately 2,323 sq ft (0.05 ac) and associated temporary impacts to wetlands totaling approximately 88 sq ft (0.002 ac).

Access to the location will be via the adjacent existing highway or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to reseed the temporarily disturbed area. The submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project 13 (Wetland 3B)

This 0.60 acre seasonal wetland (labeled as Wetland 3B on the map) accepts both roadway runoff and sheet flow from the adjacent hills. It is a combination of a wet meadow, man-made stock pond, and vegetated channel. It drains into a natural, ephemeral drainage (Water 2), which then drains into Wetland 3A. This wetland has a woody willow riparian overstory around its eastern

edge.

This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill for construction of the new alignment will result in permanent impacts to wetlands totaling approximately 10,071 sq ft (0.23 ac) and associated temporary impacts totaling approximately 1,595 sq ft (0.04 ac). Construction activities will also result in .04 acre of temporary and .19 acre of permanent impacts to riparian habitat. Access to the location will be by driving across the adjacent upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to restore the temporarily disturbed wetland and riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the submitted Revegetation Plan. The Revegetation Plan also proposes to create riparian habitat along the edges of the wetland where it is presently lacking.

Project 14 (Water 2)

This water, labeled as Water 2 on the map, includes the heavily incised ephemeral drainage which flows from Wetland 3B into Wetland 3A. This drainage system eventually flows into the San Antonio Reservoir. It does not have an associated riparian corridor.

Placement of fill necessary to construct the new alignment will result in permanent impacts totaling approximately 447 sq ft (0.01 ac; 106 linear ft). This drainage will be completely filled by the project.

Project 15 (Water 3)

This water (labeled as Water 3 on the map) includes the ephemeral creek, which runs perpendicular to SR 84 and terminates in the San Antonio Reservoir. It is heavily incised and the associated oak riparian habitat includes approximately 4-5 oaks growing at the top of the banks. There are two impact areas along this drainage. Impact Area 1 involves the temporary placement of fill necessary to accommodate the relocation of a Pacific Gas & Electric pipeline. This relocation will result in temporary impacts totaling approximately 58 sq ft (0.001 ac). Impact Area 2 includes partially filling the drainage for the new alignment. This activity will result in permanent impacts totaling approximately 3,759 sq ft (0.09 ac; 570 linear ft) and associated temporary impacts totaling approximately 755 sq ft (0.02 ac). Construction activities will also result in 0.17 acre of permanent impacts to riparian habitat.

Access to the location will be by driving across the adjacent upland or along a farm road. Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to restore the temporarily disturbed drainage areas.

Project 16 (Wetland 4)

This 0.16 acre seasonal wetland (labeled as Wetland 4 on the map) can best be described as a heavily incised, vegetated channel. It is located on both sides of SR 84. It receives water from the surrounding hills northwest of SR 84, travels under the highway through a culvert and transitions into Water 3. This wetland has an associated oak riparian corridor along the top of its banks.

This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill for the construction of the new alignment will result in permanent impacts to wetlands totaling approximately 141 sq ft (0.003 ac) and associated temporary impacts totaling approximately 693 sq ft (0.01 ac). Construction activities will also result in .05 acre of temporary impacts to riparian habitat.

Access to the location will be by the existing highway or a farm road.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed wetland and oak riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the submitted Revegetation Plan. The Revegetation Plan also proposes to create riparian habitat along the edges of the wetland where it is presently lacking.

Project 17 (Wetlands 5A-5D)

These seasonal wetlands (0.20 ac, 0.30 ac, 0.01 ac, and 0.04 ac, respectively) are found along drainages that originate outside of the project area, north of SR 84 (5A and B), with 5C extending into the project area north of SR 84, then traveling under the highway through a culvert, and emerging again as 5D, outside the construction project area, south of SR 84. They are best described as a channel vegetated with wetland plants such as *Juncus* sp and *Carex* sp. They do not have an associated riparian corridor.

Portions of Wetland 5B will be temporarily disturbed during construction due to roadwork. The roadwork will temporarily impact 1,909 sq ft (0.04 ac).

Access to the location will be via the existing highway.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs shall include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes. After construction Caltrans proposes to restore the temporarily disturbed wetland area.

Water 4

This ephemeral drainage, which runs parallel to SR 84 on the north side, connects two wetlands,

which are outside of the construction project area. This system eventually drains into the San Antonio Reservoir. This water will not be impacted by the project.

Wetlands 6A-6C

These seasonal wetlands (0.01 ac, 0.001 ac, and 0.03 ac, respectively) originate along a wetland drainage (6A) north of SR 84, and travel under the highway through a culvert, emerging again as Wetlands 6B and 6C, south of SR 84. This wetland drainage is tributary to the San Antonio Reservoir, located about 1 mile downstream. This system is described by Caltrans as a swale-like drainage. This area will not be impacted by the project.

Total Impacts

Total impacts related to the proposed project include 2.21 acres of waters of the State including 1.87 acres of fresh seasonal wetlands and 2,775 linear feet (0.34 acres) of freshwater seasonal creeks. Project activities will temporarily disturb 0.42 acres of jurisdictional waters of the U.S comprised of 0.35 acres of freshwater seasonal wetlands, and 440 linear feet (0.07 acres) of freshwater seasonal creeks. The project will also permanently impact 3.0 acres of permanent riparian habitat and 0.96 acres of temporary impacts.

Listed Species

Portions of the waters on the Project site serve as habitat for several special status species, the California red-legged frog (*Rana aurora draytonii*; CRLF), California tiger salamander (*Ambystoma californiense*; CTS) and vernal pool fairy shrimp (*Branchinecta lynchi*, hereinafter VPFS).

Conditions

1. Work within the stream/riparian corridor shall be confined to the period May 1 to October 31. Revegetation work is not confined to this time period.
2. If the Operator needs more time to complete the authorized activity, the work period may be extended on a day-to-day basis by Marcia Grefsrud at mgrefsrud@dfg.ca.gov, or the Yountville office at (707) 944-5520.
3. Work within the stream bed shall be restricted to periods of no stream flow and dry weather. Construction activities shall be timed with awareness of precipitation forecasts and likely increases in stream flow. Construction activities shall cease and all reasonable erosion control measures shall be implemented prior to the onset of precipitation. Construction activities halted due to precipitation may resume when precipitation ceases and the 72-hour weather forecast from the National Weather Service indicates a 20% or less chance of precipitation, provided no work occurs in the stream bed if water is flowing.
4. If a construction phase may cause the introduction of sediments into the stream, no phase of the project shall be started in May or in October or any year, unless all work for that phase and all associated erosion control measures are completed prior to the onset of precipitation. If a construction phase may cause the introduction of sediments into the

stream, no phase of the project shall be started unless all equipment and materials are removed from the channel at least 12 hours prior to the onset of precipitation and all associated erosion control measures are in place prior to the onset of precipitation. After any storm event, the Operator shall inspect all sites currently under construction and all sites scheduled to begin construction within the next 72 hours for erosion and sedimentation problems and take corrective action as needed. Seventy-two-hour weather forecasts from the National Weather Service shall be consulted prior to start up of any phase of the project that may result in sediment runoff to the stream, and construction plans made to meet this condition.

5. To protect and maintain riparian wetland systems and to ensure a "No Net Loss" in wildlife value or acreage of wetlands, the Operator shall submit to the Department a Mitigation Plan by December 31, 2006, which amounts to a 3:1 ratio for the acreage of bed and bank permanently impacted by the construction (0.34 x 3=1.02 acres), a 1:1 ratio for the acreage of bed and bank temporarily impacted by the construction (0.07), a 3:1 ratio for the acreage of wetlands permanently impacted (1.87x3=5.61 acres), a 1:1 ratio for the acreage of wetlands temporarily impacted (0.35 acres), and a 3:1 ratio for the acreage of riparian habitat permanently impacted (3x3=9 acres), and 1:1 ratio for the acreage of riparian habitat temporarily impacted by the project activities (0.96 acres). The mitigation can include a combination of on-site creation or restoration, off-site restoration or creation, or purchase and donation of wetlands/riparian land to an Alameda County non-profit organization along with funding and a restoration plan for the site to be protected in perpetuity. The Mitigation Plan and location of the mitigation must be approved in writing by the Department of Fish and Game prior to the start of construction. The mitigation area must be as close to the work site as is possible, preferably in the same drainage. Restoration of the stream bank and riparian zone shall include site preparation/earth movement, revegetation with native locally occurring riparian species. Work on the waterway shall not begin until the Department has approved the off-site mitigation location and Mitigation Plan or receipt of the donation has been provided.
6. The Final Mitigation Plan shall describe all both off site and on-site mitigation, design and construction plans, and survival performance criteria based on conditions #8-11.
7. Mitigation implementation shall be completed by January 31, 2008. On site temporary impacts shall be restored immediately following that portion of construction. If mitigation is not complete during the required time period, additional mitigation will be required for the additional temporal loss of habitat. The additional mitigation shall increase at a 1:5 ratio for each year the mitigation is not completed.
8. All trees and shrubs installed have an 80% survival performance criterion during the 3-year plant establishment period. In Year 5, two years after the completion of plant establishment, survival should not be lower than 70% or all failed plantings on the mitigation site should be replanted with live plantings and monitored an additional 3 years to achieve at least 80% total survival. In Year 5, species richness will be the same as the as-built condition. If a particular species suffers 100% mortality at any point in the

monitoring, it will be replaced in totality, unless a more appropriate substitution is recommended and approved by the Department based on specific environmental factors of the site conditions.

9. All disturbed slopes around and on the banks shall be seeded, mulched and fertilized with a blend of a minimum of three local grass species from the following list: California brome: 6# per acre, Purple needle grass (*Nasella pulchra*): 3# per acre, California wildflower mix or shrub seed: 5# per acre. If hydroseeding, extra tackifier and mulch shall be added. Erosion control seeding shall be at a rate of at least 25 pounds per acre, pure live seed. Monofilament shall not be used.
10. For erosion control cover there shall be a minimum of 80% cover with no bare areas larger than 3 feet x 3 feet.
11. If the survival and/or cover requirements are not meeting these goals, the Operator is responsible for replacement planting, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements for five years after planting. An annual status report on the mitigation shall be provided to the Department of Fish and Game by December 31 of each year. This report shall include the survival, percent cover, and height of both tree and shrub species. The number by species of plants replaced, an overview of the revegetation effort, and the method used to assess these parameters shall also be included. Photos from designated photo stations shall be included.
12. If construction, grading, or other project-related activities are scheduled during the nesting season of protected raptors and migratory birds (February 1 to July 31), a focused survey for active nest of such birds shall be conducted by a qualified biologist (as determined by a combination of academic training and professional experience in biological sciences and related resource management activities) within 15 days prior to the beginning to project-related activities. The results of the survey shall be faxed to (707)944-5595. Refer to Notification Number 1600-2006-0059-3 when submitting the survey to the Department. If nesting birds are found a 50-foot radius buffer should be established around the nest, a 300-foot radius buffer in the case of hawks and owls. The area should be fenced and avoided until the young have fledged, as determined by a qualified biologist. If a lapse in project-related work of 15 days or longer occurs, another focused survey and if required, consultation with the Department and United States Fish and Wildlife Service, will be required before project work can be reinitiated.
13. The project site has been identified as an area that is potentially inhabited by a listed species, the California red-legged frog, California tiger salamander, and San Joaquin kit fox and by a species of special concern, the Western burrowing owl. The Operator is required to comply with all applicable state and federal laws, including the California and Federal Endangered Species Acts. This agreement does not authorize the take of any state or federally listed species. Liability for any take or incidental take of such listed

species remains the responsibility of the Operator for the duration of the project. Any unauthorized take of such listed species may result in prosecution and nullification of the agreement.

14. Surveys and relocation shall be done in accordance with the Biological Opinion 1-1-04-F-0115 dated February 28, 2005.
15. The operator shall hire a biologist, with all necessary State and Federal permits, to relocate all fish/amphibians within the work site prior to dewatering. Captured fish/amphibians shall be moved to the nearest appropriate site on the stream. This condition does not allow for the take or disturbance of any state or federally listed species, or state listed species of special concern. A record shall be maintained of all fish/amphibians captured and moved, and the record shall be provided to the Department (c/o 1600 program, Post Office Box 47, Yountville, California 94599) with appropriate Streambed Alteration Notification number.
16. Qualified biological monitors shall be present on a continuous basis for all activities that could result in the take of a listed or protected species. The biological monitors shall ensure compliance with the measures provided in this Agreement. The biologists shall be given the authority to stop any work that may result in the take of listed or protected species. The Department shall be notified within 24 hours by email at mgregsrud@dfg.ca.gov if the biologist exercises this authority.
17. Work must be performed in isolation from the flowing stream. If there is any flow when the work is done, the operator shall construct coffer dams upstream and downstream of the excavation site and divert all flow from upstream of the upstream dam to downstream of the downstream dam. The coffer dams may be constructed with clean river gravel or sand bags, and may be sealed with sheet plastic. Sand bags and any sheet plastic shall be removed from the stream upon project completion. Clean river gravel may be left in the stream, but the coffer dams must be breached to return the stream flow to its natural channel.
18. When any dam (any artificial obstruction) is being constructed, maintained, or placed in operation, sufficient water shall at all times be allowed to pass downstream to maintain fish life below the dam pursuant to Fish and Game Code Section 5937.
19. Flow diversions shall be done in a manner that shall prevent pollution and/or siltation and which shall provide flows to downstream reaches. Flows to downstream reaches shall be provided during all times that the natural flow would have supported aquatic life. Said flows shall be sufficient quality and quantity, and of appropriate temperature to support fish and other aquatic life both above and below the diversion. Normal flow shall be restored to the affected stream immediately upon completion of work at that location.
20. The temporary stream crossings shall be constructed using a temporary bridge with a gravel approach ramp or temporary culverts backfilled with clean round river cobble and

topped with a gravel road base.

21. Storm drains lines/culverts shall be adequately sized to carry peak storm flows for the drainage to one outfall structure. The storm drain lines/culverts and the outfall structure shall be properly aligned within the stream and otherwise engineered, installed and maintained, to assure resistance to washout, and erosion of the stream bed, stream banks and/or fill. Water velocity shall be dissipated at the outfall, to reduce erosion.
22. The bottom of permanent culverts shall be placed at or below stream grade.
23. Prior to removal of existing culverts they shall be inspected for wildlife. If any wildlife is encountered during the course of the maintenance, said wildlife shall be allowed to leave the maintenance area unharmed, and shall be flushed, hazed, or herded in a safe direction away from the project site. This condition does not allow for the take or disturbance of any state or federally listed species, or state listed species of special concern.
24. Streambank areas receiving rock slope protection (rip rap) shall be back-filled with appropriate topsoil. The topsoil fill should be placed to fill the voids in the rock slope protection and provide a substrate for revegetation efforts where appropriate.
25. Rip rap will be set below grade and keyed into the bank. Rip rap rock shall be of the proper size and weight to withstand high flows.
26. Staging and storage areas for equipment, materials, fuels, lubricants and solvents, shall be located outside of the stream channel and banks, avoiding areas of concentrated ground squirrel burrows suitable for use by CTS or burrowing owls. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the stream shall be positioned over drip-pans. Any equipment or vehicles driven and/or operated within or adjacent to the stream must be checked and maintained daily, to prevent leaks of materials that if introduced to water could be deleterious to aquatic life. Vehicles must be moved away from the stream prior to refueling and lubrication.
27. The construction area shall be flagged to identify the limits of the agreed work area to prevent damage to adjacent habitat.
28. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations.
29. Silt control measures shall be utilized throughout all phases of the project where silt and/or earthen fill threaten to enter Waters of the State. Silt control structures shall be monitored for effectiveness and shall be repaired or replaced as needed. Build up of soil behind the fence shall be removed promptly and any breaches or undermined areas repaired at once.
30. A copy of this agreement must be provided to the contractor and all subcontractors who work within the stream zone and must be in their possession at the work site.

31. Building materials and/or construction equipment shall not be stockpiled or stored where they could be washed into the water or where they will cover aquatic or riparian vegetation.
32. Debris, soil, silt, bark, rubbish, creosote-treated wood, raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, resulting from project related activities, shall be prevented from contaminating the soil and/or entering the waters of the state. Any of these materials, placed within or where they may enter a stream or lake, by Operator or any party working under contract, or with the permission of the Operator, shall be removed immediately.
33. The contractor shall not dump any litter or construction debris within the riparian/stream zone. All such debris and waste shall be picked up daily and properly disposed of at an appropriate site.
34. Department personnel or its agents may inspect the work site at any time.
35. The Operator is liable for compliance with the terms of this Agreement, including violations committed by the contractors and/or subcontractors. The Department reserves the right to suspend construction activity described in this Agreement if the Department determines any of the following has occurred:
 - A). Failure to comply with any of the conditions of this Agreement
 - B). Information provided in support of the Agreement is determined by the Department to be inaccurate.
 - C). Information becomes available to the Department that was not known when preparing the original conditions of this Agreement (including, but not limited to, the occurrence of State or federally listed species in the area or risk to resources not previously observed)
 - D). The project as described in the Agreement has changed or conditions affecting fish and wildlife resources change.

Any violation of the terms of this Agreement may result in the project being stopped, a citation being issued, or charges being filed with the District Attorney. Contractors and subcontractors may also be liable for violating the conditions of this agreement.

Amendments and Extension to Expiration Date

The Operator shall notify the Department before any modifications are made in the project plans submitted to the Department. Project modifications may require an amendment or a new notification. To modify the project, a written request for an amendment must be submitted to the Department (1600 Program, Post Office Box 47, Yountville, California 94599). An amendment requires a fee. The Fee Schedule can be obtained at www.dfg.ca.gov/1600 or by phone at (707) 944-5520. Amendments to the original Agreement are issued at the discretion of the Department.

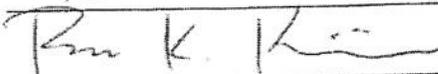
To renew the Agreement beyond the expiration date, a written request for an extension must be submitted to the Department (1600 Program, Post Office Box 47, Yountville, California 94599) for consideration at least 30 days before the Agreement expiration date. An extension requires a fee. Extensions of the original Agreement are issued at the discretion of the Department.

This Agreement is transferable to subsequent owners of the project property by requesting an amendment.

Please note that you may not proceed with construction until your proposed project has undergone CEQA review and the Department signs the Agreement.

I, the undersigned, state that the above is the final description of the project I am submitting to the Department for CEQA review, leading to an Agreement, and agree to implement the conditions above required by the Department as part of that project. I will not proceed with this project until the Department signs the Agreement. I also understand that the CEQA review may result in the addition of measures to the project to avoid, minimize, or compensate for significant environmental impacts:

Operator's name (print): RON K. KIAAINA

Operator's signature: 

Signed the 13th day of JUNE, 2006

1600-2006 - For Department Use Only

Notification Number:	0059-3	Date Received	2/10/06	Date Completed	
Fee Enclosed?	<input checked="" type="checkbox"/> Yes \$ 4,000.00		<input type="checkbox"/> No		
Action Taken/Notes	# 082-893429 DEPT. OF TRANSPORTATION				

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME

GRETS RUD
GARRETT
LT. CHRISTENSEN

Fish & Game

FEB 10 2006

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

All fields must be completed unless otherwise indicated.
(See enclosures for instructions.)

Yountville

Notification Type	
<input type="checkbox"/> Timber Harvesting Plan (No. _____)	<input type="checkbox"/> Water Application (No. _____)
<input type="checkbox"/> Commercial Gravel Extraction (No. _____)	<input checked="" type="checkbox"/> Other

Application Information			
	Name	Address	Telephone/FAX
Applicant:	California Department of Transportation (Caltrans)	See contact person	Business: See contact person Fax:
Operator:	Ron Kiaaina (Project Manager)	P.O. Box 23660 Oakland, Ca 95623-0660	Business: 510-286-4193 Fax: 510-286-5122
Contractor: (if known)	unknown		Business: Fax:
Contact Person: (if not applicant)	Shanna Zahner (Biologist)	703 B Street Marysville, Ca 95901	Business: 530-740-4815 Fax: 530-741-4457
Property Owner:	Multiple-see Attachment 2		Business: Fax:

Project Location				
Location Description:	Alameda County, State Route 84 southwest edge of the city of Livermore			
County	Assessor's Parcel Number			
Alameda	See Attachment 2			
USGS Map	Township	Range	Section	Latitude/Longitude
See Attachment 1				37° 38' 26" N/ 121° 47' 43" W
Name of River, Stream, or Lake:	Unnamed creeks			
Tributary To?	Arroyo Valle, San Antonio Reservoir			

Name of Applicant: Caltrans

Project Description							
Project Name:	Pigeon Pass (Alameda-84 Curve Realignment)						
Start Date:	2007	Completion Date:	2009	Project Cost:	\$25 million	Number of Stream Encroachments: (Timber Harvesting Plans Only)	NA
Describe project below: (Attach separate pages if necessary)							
See Attachment 1							
<input checked="" type="checkbox"/> Continued on separate page (s)							

Attachments/Enclosures		
Attach or enclose the required documents listed below and check the corresponding boxes.		
<input checked="" type="checkbox"/> Project Description	<input checked="" type="checkbox"/> Map showing project location, including distances and/or directions from nearest city or town	<input checked="" type="checkbox"/> Construction plans and drawings pertaining to the project
Completed CEQA documents:	<input type="checkbox"/> Notice of Exemption <input type="checkbox"/> Negative Declaration <input type="checkbox"/> Draft or Final Environmental Impact Report	<input type="checkbox"/> Mitigated Negative Declaration <input checked="" type="checkbox"/> Notice of Determination
Copies of applicable local, State, or federal permits, agreements, or other authorizations:	<input type="checkbox"/> Local. Describe:	
	<input checked="" type="checkbox"/> State. Describe: Army Corps of Engineers 404 permit; Regional Water Quality Control Board 401 Cert (all pending)	

I hereby certify that all information contained in this notification is true and correct and that I am authorized to sign this document. I understand that in the event this information is found to be untrue or incorrect, I may be subject to civil or criminal prosecution and the Department may consider this notification to be incomplete and/or cancel any Lake or Streambed Alteration Agreement issued pursuant to this notification. I understand that this notification is valid only for the project described herein and that I may be subject to civil or criminal prosecution for undertaking a project that differs from the one described herein, unless I have notified the Department of that project in accordance with Fish and Game Code Section 1602.

I understand that a Department representative may need to inspect the property where the project described herein will take place before issuing a Lake or Streambed Alteration Agreement pursuant to this notification. In the event the Department determines that a site inspection is necessary, I hereby authorize the Department to enter the property where the project described herein will take place to inspect the property at any reasonable time and certify that I am authorized to grant the Department permission to access the property.

I request the Department to first contact me at (insert telephone number) _____ to schedule a date and time to enter the property where the project described herein will take place and understand that this may delay the Department's evaluation of the project described herein.

Jean L Baker
Operator or Operator's Representative

Jan 12, 2006
Date

Attachment 1

Purpose and Need

The segment of SR 84 through the Vallecitos Hills / Pigeon Pass area has become functionally obsolete due to the combination of the existing features of the highway and increased volume of traffic. SR 84 has a winding alignment that generally follows the natural topography. Grades on SR 84 reach a maximum of 10 % and there are locations where stopping sight distance is limited by the curvature of the highway. Shoulder widths do not meet current design standards. There are no opportunities to pass slower vehicles. During peak hours, traffic is congested due to the winding alignment of the roadway through the Vallecitos Hills / Pigeon Pass area.

The project under consideration would correct existing horizontal and vertical alignment deficiencies on SR 84. The purpose of the project is to improve safety and traffic operations by realigning and adding truck climbing lanes through the Vallecitos Hills / Pigeon Pass area. The average accident rate per million vehicle miles for a two-lane conventional highway is expected to be about 1.32 acc/mvm. The actual accident rate for SR 84 through the Vallecitos Hills / Pigeon Pass area is 1.42 acc/mvm. Improving the alignment and adding truck-climbing lanes to the roadway is expected to result in lower overall accident rates on SR 84.

Project Location and Description

The project is located southwest of Livermore on SR 84 in Alameda County. It begins near the Ruby Hills Drive/Kalthoff and SR 84 intersection and continues west to Post Mile 23.0. It can be found on the Livermore and La Costa Valley quadrangles, R 1E, and R 2E. Township and Sections are not available because the land was originally part of a Spanish Land Grant and has not been surveyed.

From I-580 take the 1st St/Springtown exit through Livermore. 1st St. will turn into Holmes, which turns into Vallecitos Rd (SR 84). Take Vallecitos Rd to the Ruby Hills/Kalthoff and Vallecitos intersection. From I-680 take the SR84/Vallecitos Rd exit. Follow to the Ruby Hills/Kalthoff and Vallecitos Rd. intersection.

Project Descriptions

Below is a description of each project (i.e. activity), as defined by the Department of Fish and Game, within the proposed Caltrans construction project known as Pigeon Pass.

Attached is a table that quantifies temporary and permanent impacts for each project.

Equipment to be used at each location will most likely include but is not limited to bulldozers, backhoes, excavators, compactors, and dump trucks.

Construction is expected to begin August 1, 2006 and end November 1, 2009.

Project 1 (Water 1A)

This project affects an unnamed ephemeral creek (labeled as Water 1A on the maps) which runs parallel to State Route 84 (SR 84) on the south side. This water is a tributary of Arroyo del Valle. The drainage in this area is shallow and characterized by indistinct banks vegetated with nonnative annual grasses typical for the area. See the attached habitat description for annual grassland. The area is devoid of a woody riparian overstory.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 63 ft² (0.001 ac; 10 linear ft) and associated temporary impacts totaling approximately 528 ft² (0.01 ac).

Access to the location will be via the adjacent existing highway or by driving across the upland. No access roads within the streambed are planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Cost of Project: \$50.00

Permit Fee: \$200.00

Project 2 (Wetland 1A)

This project affects a seasonal wetland (labeled as Wetland 1A on the maps), which is tributary to the Arroyo del Valle. In the past, check dams made of rock were placed within the ephemeral creek (Water 1A) at this location. This has created a bottleneck, allowing wetland characteristics to evolve within the creek. The wetland is heavily vegetated with cattails. The area is devoid of woody riparian overstory.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 7,866 ft² (0.18 ac) and associated temporary impacts totaling

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approximately 1, 159 ft² (0.03 ac). The streambed alterations at this location will require that a series of three natural bottom ponds be constructed at the toe of slope of the new alignment from approximately station number 80+40 to 82+40 (see maps) to direct the upstream flow. A ditch will connect the three ponds. The ditches will be lined with rock slope protection (RSP) at the outfalls of each pond to slow water velocity. Construction of the pond and ditch complex, as opposed to a straight channel, will reduce velocity through the area.

Access to the location will be via the adjacent existing highway or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area, as well as the newly created ponds. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Cost of Project: \$3,600.00

Permit Fee: \$200.00

Project 3 (Water 1B)

This ephemeral drainage (labeled as Water 1B on the map) is located upstream of the Wetland 1A along the southern edge of SR 84, and is tributary to Arroyo del Valle. It is a heavily incised, oak riparian stream corridor with steep banks leading to the channel bed at the toe of slope of SR 84. This drainage is connected to the adjacent, upstream wetland 1C by a culvert that passes under a residential driveway.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 4,081 ft² (0.09 ac; 895 linear ft) and associated temporary impacts totaling approximately 982 ft² (0.02 ac). The temporary impacts include the installation of a temporary culvert which will provide access between the east and west sides of the creek. Construction activities will also result in .36 acre of temporary, and 1.46 acre of permanent impacts to oak riparian habitat.

Access to the location will be via the adjacent existing highway, driveways, or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, the temporary culvert will be removed and the ground recontoured to its pre-project condition. Caltrans proposes to reseed the temporarily disturbed area and to replant the riparian corridor areas. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters and riparian species to be used.

Project Cost: \$9,900.00

Permit Fee: \$250.00

Project 4 (Wetland 1B)

This is a 0.01 acre seasonal wetland, labeled as Wetland 1B on the map, within the Water 1 system. It forms at the inlet of a culvert that passes under SR 84 and can best be described as a vegetated channel. The channel is devoid of woody riparian overstory.

Placement of fill or construction of the new alignment will result in permanent impacts totaling approximately 55 ft² (0.001 ac) and associated temporary impacts totaling approximately 13 ft² (0.0003 ac).

Access to the location will be via the adjacent existing highway.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to reseed the temporarily disturbed area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project Cost: \$80.00

Permit Fee: \$200.00

Project 5 (Wetland 1C)

This is a 0.67 acre seasonal wetland (labeled as Wetland 1C on the map) south of SR 84. This wetland is a combination of flow from Water 1C and the nearby hills. It can best be described as a combination of swale and wet meadow. There is a small area of oak riparian habitat associated with the west end of this wetland. The riparian habitat is part of the riparian corridor that runs along Water 1C described below.

Placement of fill for the construction of the new alignment and installation of a 48 inch (in) culvert and a 12 in culvert to facilitate drainage under the new alignment will result in permanent impacts to wetlands totaling approximately 18,297 ft² (0.42 ac) and associated temporary impacts totaling approximately 4,150 ft² (0.10 ac). Construction activities will also result in .12 acre of temporary impacts to riparian habitat.

Access to the location will be via the adjacent existing highway or a farm road.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters and riparian species to be used.

Project Cost: \$28,000.00

Permit Fees: \$750.00

Project 6 (Water 1C)

This heavily incised, ephemeral drainage (labeled as Water 1C on the map) receives flow from the bermed Wetland 1D via a spillway/culvert. This drainage, which has an associated dense oak riparian corridor, discharges into the downstream Wetland 1C. It is a tributary of Arroyo del Valle.

There will be no impacts to the bed and bank of this drainage; however, there is the potential to temporarily impact .15 acre of the outer edge of the oak riparian habitat due to construction equipment and work activities associated with adjacent roadwork.

Access to the location will be through the adjacent upland areas. No access roads within the stream zone are planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed riparian area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the riparian species to be used.

Project Cost: \$200.00

Permit Fee: \$200.00

Wetland 1D

This 0.35 acre seasonal wetland (labeled as Wetland 1D on the map) is south of SR 84. It is fed by Water 1D and drained by Water 1C. A wet meadow-type wetland has formed where Water 1D has braided out in this area behind a man-made berm. This area will be avoided during the construction therefore there will be no impacts.

Project 7 (Water 1D)

This ephemeral drainage (labeled as Water 1D) is located upstream of Wetland 1D and flows parallel to SR 84. This segment of the Water 1 system receives drainage from the upstream Wetland 1E, is moderately incised and has a dense oak/willow riparian habitat. It is a tributary of Arroyo del Valle.

Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 5,952 ft² (0.14 ac; 917 linear feet) and associated temporary impacts totaling approximately 718 ft² (0.02 ac). Work activities will also result in .24 acre of temporary, and 1.18 acre of permanent impacts to riparian habitat. The creek channel will be realigned from its existing location to the north toe of the new slope from approximately station numbers 69+65 to 72+80. This new channel will have a combination of natural bottom and some rock protection in areas where the additional erosion protection is needed, with rock weirs placed at appropriate locations along the new channel to create seasonally ponded wetland areas to mitigate impacts to Wetlands 1C, 1D, and 1E.

Access to the location will be via the adjacent existing highway or upland areas. There are no access roads within the stream zone planned.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed waters and riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the previously submitted Revegetation Plan. The recreated channel will, at minimum, be seeded with the wetland/waters species proposed in the previously submitted Revegetation Plan. If conditions are suitable to support riparian vegetation after construction, the area will also be augmented with riparian species proposed in the Revegetation Plan.

Project Cost: \$1,200

Permit Fee: \$200.00

Project 8 (Wetland 1E)

This 0.12 acre seasonal wetland (labeled as Wetland 1E) is located above the origin of Water 1E in a low-lying area that slopes towards Water 1D. It receives water from sheet flow runoff from the adjacent hills and from a culvert under SR 84. Under heavy storm

conditions, it has the potential to receive water from Wetland 1F. It is vegetated with wetland grasses and has no woody overstory.

This wetland will be completely filled by the construction project. Placement of fill for construction of the new alignment will result in permanent impacts totaling approximately 5,365 ft² (0.12 ac).

Project Cost: \$5,200

Permit Fee: \$250.00

Project 9 (Water 1E)

This drainage, labeled as Water 1E on the map, connects the headwaters Wetland 1F with all downstream jurisdictional features. It is a very shallow, indistinct drainage that has no associated riparian overstory and is vegetated only with nonnative annual grasses. It is a tributary of Arroyo del Valle.

This drainage will be completely filled by the construction project. Placement of fill necessary to construct the new alignment will result in permanent impacts totaling approximately 557 ft² (0.01 ac; 277 linear ft). This drainage area will be recreated and vegetated as described in the Project 8, as the two projects are connected and will be similarly impacted.

Project Cost: \$4,900.00

Permit Fee: \$200.00

Project 10 (Wetland 1F)

This large 1.2 acre seasonal wetland (labeled as Wetland 1F on the maps) forms in a low area immediately adjacent to the existing roadway on the east side of the Pigeon Pass saddle, and accepts roadway runoff and sheet flow from the surrounding uplands. Wet season observation, topography, and drainage patterns indicate that this system is not typically hydrologically connected to a jurisdictional water body, except possibly during heavy storm conditions, when it may overflow into Wetland 1E. The edges are populated with wetland plants such as *Eleocharis* sp., *Carex* sp., and *Juncus* sp. during the growing season with open water comprising the remaining inner portion. The area is devoid of a riparian overstory.

Placement of fill necessary to construct the new alignment will result in permanent impacts to wetlands totaling approximately 33,971 ft² (0.78 ac) and associated temporary impacts totaling approximately 5,799 ft² (0.13 ac).

Access to the location will be via the adjacent existing highway, driveway, or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to reseed the temporarily disturbed area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project Cost: \$180,000.00

Permit Fee: \$1,100.00

Project 11 (Wetland 2)

This 0.07 acre wetland (labeled as Wetland 2 on the map) is the result of a spring at the beginning of a seasonal drainage, at the top of a hill. A small plateau at the spring creates an area for water to saturate the ground, and sometimes pool, before it overflows down the hill during the wet season. The wetland is vegetated with *Juncus* sp., *Eleocharis* sp., *Cyperus* sp., and *Rumex* sp.

This wetland will be completely filled by the new alignment. Placement of fill necessary to construct the new alignment and installation of a 750 mm (29.5 in) culvert to facilitate drainage will result in permanent impacts to wetlands totaling approximately 3,162 ft² (0.07 ac).

Project Cost: \$3,000.00

Permit Fee: \$200.00

Project 12 (Wetland 3A)

This 0.06 acre seasonal wetland (labeled as Wetland 3A on the map) is partially within a creek bed and a backwater area of a creek (Water 2). It is sparsely vegetated with wetland plants such as *Rumex* sp., *Cyperus* sp., *Eleocharis* sp. and *Juncus* sp., but is devoid of a riparian overstory.

This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill necessary to construct the new alignment and installation of a 28 in culvert to facilitate drainage will result in permanent impacts to wetlands totaling approximately 2,323 ft² (0.05 ac) and associated temporary impacts to wetlands totaling approximately 88 ft² (0.002 ac).

Access to the location will be via the adjacent existing highway or by driving across the upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to reseed the temporarily disturbed area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project Cost: \$3,000.00

Permit Fee: \$200.00

Project 13 (Wetland 3B)

This 0.60 acre seasonal wetland (labeled as Wetland 3B on the map) accepts both roadway runoff and sheet flow from the adjacent hills. It is a combination of a wet meadow, man-made stock pond, and vegetated channel. It drains into a natural, ephemeral drainage (Water 2), which then drains into Wetland 3A. This wetland has a woody willow riparian overstory around its eastern edge.

This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill for construction of the new alignment will result in permanent impacts to wetlands totaling approximately 10,071 ft² (0.23 ac) and associated temporary impacts totaling approximately 1,595 ft² (0.04 ac). Construction activities will also result in .04 acre of temporary and .19 acre of permanent impacts to riparian habitat.

Access to the location will be by driving across the adjacent upland.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to restore the temporarily disturbed wetland and riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the previously submitted Revegetation Plan. The Plan also proposes to create riparian habitat along the edges of the wetland where it is presently lacking.

Project Cost: \$19,200.00

Permit Fee: \$500.00

Project 14 (Water 2)

This water, labeled as Water 2 on the map, includes the heavily incised ephemeral drainage which flows from Wetland 3B into Wetland 3A. This drainage system eventually flows into the San Antonio Reservoir. It does not have an associated riparian corridor.

Placement of fill necessary to construct the new alignment will result in permanent impacts totaling approximately 447 ft² (0.01 ac; 106 linear ft). This drainage will be completely filled by the project.

Project Cost: \$180.00

Permit Fee: \$200.00

Project 15 (Water 3)

This water (labeled as Water 3 on the map) includes the ephemeral creek, which runs perpendicular to SR 84 and terminates in the San Antonio Reservoir. It is heavily incised and the associated oak riparian habitat includes approximately 4-5 oaks growing at the top of the banks.

There are two impact areas along this drainage. Impact Area 1 involves the temporary placement of fill necessary to accommodate the relocation of a Pacific Gas & Electric pipeline. This relocation will result in temporary impacts totaling approximately 58 ft² (0.001 ac). Impact Area 2 includes partially filling the drainage for the new alignment. This activity will result in permanent impacts totaling approximately 3,759 ft² (0.09 ac; 570 linear ft) and associated temporary impacts totaling approximately 755 ft² (0.02 ac). Construction activities will also result in .17 acre of permanent impacts to riparian habitat.

Access to the location will be by driving across the adjacent upland or along a farm road.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to restore the temporarily disturbed drainage areas. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project Cost (Impact Area 1): \$700.00

Permit Fee: \$200.00

Project Cost (Impact Area 2): \$66,500.00

Permit Fee: \$750.00

Project 16 (Wetland 4)

This 0.16 acre seasonal wetland (labeled as Wetland 4 on the map) can best be described as a heavily incised, vegetated channel. It is located on both sides of SR 84. It receives water from the surrounding hills northwest of SR 84, travels under the highway through a culvert and transitions into Water 3. This wetland has an associated oak riparian corridor along the top of its banks.

This wetland will be partially filled by the new alignment, with a portion also being temporarily disturbed during construction. Placement of fill for the construction of the new alignment will result in permanent impacts to wetlands totaling approximately 141 ft² (0.003 ac) and associated temporary impacts totaling approximately 693 ft² (0.01 ac). Construction activities will also result in .05 acre of temporary impacts to riparian habitat.

Access to the location will be by the existing highway or a farm road.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction, Caltrans proposes to restore the temporarily disturbed wetland and oak riparian areas using the wetland/waters and riparian species and the mitigation strategy proposed in the previously submitted Revegetation Plan. The Plan also proposes to create riparian habitat along the edges of the wetland where it is presently lacking.

Project Cost: \$16,000.00

Permit Fee: \$500.00

Project 17 (Wetlands 5A-5D)

These seasonal wetlands (0.20 ac, 0.30 ac, 0.01 ac, and 0.04 ac, respectively) are found along drainages that originate outside of the project area, north of SR 84 (5A and B), with 5C extending into the project area north of SR 84, then traveling under the highway through a culvert, and emerging again as 5D, outside the construction project area, south of SR 84. They are best described as a channel vegetated with wetland plants such as *Juncus* sp and *Carex* sp. They do not have an associated riparian corridor.

Portions of Wetland 5B will be temporarily disturbed during construction due to roadwork. The roadwork will temporarily impact 1,909 ft² (0.04 ac).

Access to the location will be via the existing highway.

Erosion control and soil stabilization measures will be implemented in accordance with Caltrans' Best Management Practices (BMP). These BMPs could include, but are not limited to, the use of silt fences, fiber rolls, and the application of fiber matrix on unfinished slopes.

After construction Caltrans proposes to restore the temporarily disturbed wetland area. The previously submitted Revegetation Plan outlines the proposed mitigation strategy and identifies the wetland/waters species to be used.

Project Cost: \$ 4,900.00

Permit Fee: \$200.00

Water 4

This ephemeral drainage, which runs parallel to SR 84 on the north side, connects two wetlands, which are outside of the construction project area. This system eventually drains into the San Antonio Reservoir. This water will not be impacted by the project.

Wetlands 6A-6C

These seasonal wetlands (0.01 ac, 0.001 ac, and 0.03 ac, respectively) originate along a wetland drainage (6A) north of SR 84, and travel under the highway through a culvert, emerging again as Wetlands 6B and 6C, south of SR 84. This wetland drainage is tributary to the San Antonio Reservoir, located about 1 mi downstream. This system can best be described as a swale-like drainage. This area will not be impacted by the project.

Habitat Type Descriptions

Oak Woodland, Riparian and Upland: The valley oak woodland plant community, which correspond with the CNPS's valley oak series, can be found along some of the ephemeral creeks and scattered in the upland nonnative grassland (URS 2002). It is dominated by valley oak (*Quercus lobata*) and includes coast live oak (*Quercus agrifolia*) and California buckeye (*Aesculus californica*) (URS 2002). The woodlands interspersed in the upland are lower in density than the riparian habitat and are typical of oak woodlands that have a nonnative grassland understory (URS 2002). The riparian areas also include western sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), sandbar willow (*Salix exigua*), red willow (*Salix laevigata*), and arroyo willow (*Salix lasiolepis*) in the tree layer. The shrub layer consists of California rose (*Rosa californica*), Pacific blackberry (*Rubus ursinus*), blue elderberry (*Sambucus mexicana*), common snowberry (*Symphoricarpos albus* var. *laevigatus*), and poison oak (*Toxicodendron diversilobum*). A complete list of vegetation identified during botanical surveys is found in Appendix B.

Annual Grassland: Nonnative grassland is the dominant vegetation community within the LOD and surrounding area. Most of this grassland is completely open, with some scattered oaks. This plant community corresponds to the CNPS's California annual grassland series (URS 2002). The dominant species within the grassland include slender wild oats (*Avena barbata*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), perennial ryegrass (*Lolium multiflorum*), and Medusa-head (*Taeniatherum caput-medusae*) (URS 2002). Native and nonnative herbaceous species are also present, as well as patches of creeping wildrye (*Leymus triticoides*) (CNPS's creeping ryegrass series) and purple needlegrass (*Nassella pulchra*) (URS 2002). A complete list of all vegetation identified during botanical surveys is found in Appendix B.

Hydrophytic Vegetation: The seasonal wetlands located within the area support vegetation that is normally only found growing under anaerobic conditions characteristic of wetlands. Wetlands occur as narrow linear bands along channels, in pockets at culvert inlet and outlets, in natural swales and depressions and in man-made features where water collects. The wetland habitats in the project area are dominated by herbaceous vegetation that include tall flatsedge (*Cyperus eragrostis*), spikerush (*Eleocharis macrostachya*), fringed willow herb (*Epilobium ciliatum* ssp. *ciliatum*), spreading rush (*Juncus patens*), rabbit foot grass (*Polypogon monspeliensis*), low club rush (*Scirpus cernuus*), and mulefat (*Baccharis salicifolia*). Shrub and tree species, such as red willow (*Salix laevigata*), arroyo willow (*Salix lasiolpis*) and mulefat (*Baccharis salicifolia*) are present

within or along wetland edges at several locations. Grasses, such as Bermuda grass (*Cynodon dactylon*), Italian ryegrass (*Lolium multiflorum*), Dallis grass (*Paspalum dilatatum*), ditch grasses (*Polypogon* sp) and other nonnative annuals dominate many of these wetland areas. A complete list of vegetation identified during botanical surveys is found in Appendix B.



DEPARTMENT OF FISH AND GAME

Bay Delta Region
Post Office Box 47
Yountville, California 94599
(707) 944-5520
www.dfg.ca.gov



December 16, 2010

Ron Kiaaina
California Department of Transportation
111 Grand Avenue
Oakland, CA 94623

Subject: Extension of Lake or Streambed Alteration Agreement
Notification No. 1600-2006-0059-R3
State Route 84 Pigeon Pass, Alameda County

Dear Mr. Kiaaina:

The Department of Fish and Game (“Department”) received your request to extend Lake or Streambed Alteration Agreement (“Agreement”) and extension fee, for the above referenced agreement. The Department hereby grants your request to extend the Agreement from December 31, 2010 to December 31, 2014. All other conditions in the original Agreement remain in effect.

Copies of the original Agreement and this letter must be readily available at project worksites and must be presented when requested by a Department representative or other agency with inspection authority.

If you have any questions regarding this matter, please contact Melissa Escaron, Staff Environmental Scientist, at (707) 339-0334 or mescaron@dfg.ca.gov.

Sincerely,

for Scott Wilson
Environmental Program Manager
Bay Delta Region

cc: Melissa Escaron
Lieutenant Christensen



California Regional Water Quality Control Board San Francisco Bay Region



Dan Skopec
Acting Agency Secretary

1515 Clay Street, Suite 1400, Oakland, California 94612
(510) 622-2300 • Fax (510) 622-2460
<http://www.waterboards.ca.gov/sanfranciscobay>

Arnold Schwarzenegger
Governor

Date: **MAY 18 2006**
File No. 2199.9457 (BJT)
Site No. 02-01-C0884

Certified Mail No. 70033110000265559131

Mr. Ron Kiaaina
California Department of Transportation
111 Grand Avenue
P.O. Box 23660
Oakland, CA 94623

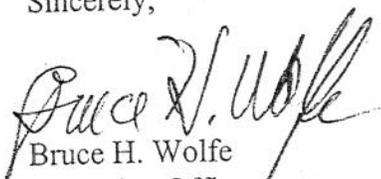
**Subject: Waste Discharge Requirements and Water Quality Certification for the Pigeon Pass
Route 84 Realignment Project**

Dear Mr. Kiaaina:

The San Francisco Bay Regional Water Quality Control Board adopted Order No. R2-2006-0033, Waste Discharge Requirements and Water Quality Certification for the Pigeon Pass Route 84 Realignment Project, on May 10, 2006. The adopted Order is attached.

If you have any questions, comments, or concerns, please contact Brendan Thompson of my staff at (510) 622-2506, or via e-mail to BThompson@waterboards.ca.gov.

Sincerely,


Bruce H. Wolfe
Executive Officer

cc: Mr. Oscar Balaguer, SWRCB-DWQ
Mr. Hal Durio, Regulatory Branch, USACE
Ms. Marcia Grefsrud, CDFG, Yountville
✓ Hardeep Takhar, Caltrans

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER No. R2-2006-0033

WASTE DISCHARGE REQUIREMENTS AND WATER QUALITY CERTIFICATION FOR:
CALIFORNIA DEPARTMENT OF TRANSPORTATION

PIGEON PASS STATE ROUTE 84 REALIGNMENT PROJECT, ALAMEDA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, hereinafter Water Board, finds that:

1. The California Department of Transportation (hereinafter the Department) proposes to realign a 2.3-mile portion of State Route 84 (hereinafter SR 84), from Post Mile 20.7 to Post Mile 23.0, between the City of Livermore and Interstate 680, in an unincorporated area of Alameda County. The Project consists of the following elements:
 - a. Improvement of the existing SR 84 by realigning steep and winding portions, installing truck-climbing lanes, and widening to current Federal Highway standards;
 - b. Conversion of portions of the existing SR 84 alignment to frontage road; and
 - c. Obliteration of portions of the existing SR 84.
2. Project construction is expected to occur over a three-year period, beginning in March 2007, and ending in October 2010. Construction will be divided into three phases:
 - a. Construction of the westernmost two-thirds of the new frontage road and temporary detour road;
 - b. Construction of the majority of the realigned Route 84; and
 - c. Construction of the last one-third of the frontage road, removal of the temporary detour, and smoothing the transitions between the new and existing roadway.
3. There are approximately 4.66 acres of jurisdictional waters of the United States, including creeks and wetlands, on the Project site that are waters of the State and delineated waters of the United States. The site's waters are comprised of:
 - a. Approximately 5,318 linear feet (0.61 acres) of freshwater seasonal creeks; and
 - b. Approximately 4.05 acres freshwater seasonal wetlands.
4. The Project will result in the placement of approximately 654,000 cubic yards of cut and fill, with all cut being used on-site, and no import of fill material. 4,130 cubic yards of earth will permanently fill approximately 2.21 acres of jurisdictional waters of the United States, comprised of 1.87 acres of fresh seasonal wetlands and 2,775 linear feet (0.34 acres) of freshwater seasonal creeks, which includes mature oak woodland riparian forest. Project activities will temporarily disturb 0.42 acres of jurisdictional waters of the United States, comprised of 0.35 acres of freshwater seasonal wetlands, and 440 linear feet (0.07 acres) of freshwater seasonal creeks.

5. Portions of the waters on the Project site serve as habitat for the federally and state-listed threatened California red-legged frog (*Rana aurora draytonii*, hereinafter CRLF) and California tiger salamander (*Ambystoma californiense*, hereinafter CTS). The Project site also provides habitat for the federally-listed threatened vernal pool fairy shrimp (*Branchinecta lynchi*, hereinafter VPFS).
6. **Mitigation Plan:** To mitigate for permanent and temporary fill of 2.21 and 0.42 acres of wetlands, respectively, a combination of on and off-site mitigation will be implemented, as described in the Department's Draft Revised Water Quality Certification Mitigation and Monitoring Report (hereinafter Draft Report), dated, "Revised Draft 2006," and received by the Water Board on March 13, 2006. The Draft Report does not propose mitigation sufficient to fully address the proposed Project impacts. This Order requires the Department to complete additional mitigation to fully address all impacts. The Draft Report's proposed mitigation consists of the following:
 - a. **On-site creation.** 0.92 acres of freshwater seasonal wetland and 791 linear feet (0.18 acres) of freshwater seasonal creeks will be created on-site. Existing freshwater seasonal wetlands will be expanded to create 0.43 acres of new wetlands. 0.49 acres of freshwater seasonal wetlands will be created on-site, at locations not historically wetlands, using excavated soil from permanently impacted wetland areas on-site. Approximately 791 feet (0.18 acres) of seasonal creek channel will be created adjacent to the existing tributary to Arroyo del Valle, which is proposed to be permanently impacted by the Project.
 - b. **On-site restoration.** To mitigate for a portion of the Project's 0.42 acres of temporary impacts to habitat, the Department is proposing to restore 0.42 acres of temporarily disturbed areas within the Project site. Temporarily disturbed areas will be restored on an ongoing basis throughout the life of the Project immediately following completion of construction in each section.
 - c. **On-site enhancement.** The Department also proposes to enhance approximately 1,510 linear feet (460 meters) of riparian oak woodland habitat along the ephemeral creek paralleling Highway 84 from Station 72+80 through 77+40, downstream from the relocated creek channel.
 - d. **On-site creek relocation.** An estimated 535 linear feet of the 2,775 feet of impacted channel are being relocated at the east end of the project from stations 80+35 to 81+05, and 81+50 to 82+40. Caltrans has not proposed taking credit for this channel relocation as mitigation to offset channel loss since a future project may result in impacts to the relocated channel. These relocated channel portions are anticipated to be in place at least until the completion of the Alameda 84 realignment project, in 2010, and at least 5 years prior to any future impacts, thus serving to offset temporal losses on the project.
 - e. **Off-site enhancement and creation.** The Department has proposed wetland creation and riparian enhancement mitigation on privately owned and actively grazed rangeland on the southern side of Patterson Pass Road, immediately east of Cross Rd.

in the city of Livermore (Sweet Property). The site contains hillside seeps and an unnamed tributary to the Arroyo Mocho. Proposed mitigation at the Sweet Property includes creation of 2.5 acres of freshwater seasonal wetlands, enhancement of 5,410 linear feet of degraded creek, preservation of 52 acres of contiguous upland grassland, a grazing management plan, and conservation easements over the mitigation areas.

The mitigation proposed in the Draft Report would not fully mitigate for the proposed creek impacts, in part because the Department has not yet been able to identify or does not yet have fully in place all mitigation locations, mitigation site functions and values, detailed mitigation designs, draft conservation easement agreements, a timeline identifying when mitigation would be completed, and appropriate compensation for permanent impacts to riparian waters. The Department will also be permanently impacting special-status species habitat and a significant length and area of mature oak riparian forest. Additionally, while the proposed mitigation would be in-kind, significant portions would be located off-site. Pursuant to the California Wetlands Conservation Policy and the Basin Plan, the Board shall generally require additional mitigation when the mitigation is implemented off-site. Therefore, this Order requires that jurisdictional wetlands and waters be mitigated by ensuring the successful restoration or creation of, at a minimum, a total of 5.6 acres of freshwater seasonal wetlands, and 11,900 linear feet of enhanced freshwater seasonal creeks, at one or more locations that are simultaneously within Alameda County and within the Alameda Creek Watershed. The remaining required mitigation after implementation of the 1,510 linear feet of proposed on-site creek enhancement and off-site mitigation comprised of creation of 2.5 acres of freshwater seasonal wetlands and enhancement of 5,400 linear feet of creek at the Sweet Property will be 2.1 acres of wetlands creation and 4,980 linear feet of creek enhancement.

The Water Board recognizes that some mitigation sites may also provide opportunities to complete preservation and enhancement of waters and wetlands. The Department may propose a creek and wetland mitigation package that substitutes preservation and enhancement for a portion of the required restoration and creation. Such substitution must be in all cases beyond the overall benefit provided by the wetland and creek restoration and creation required by this Order.

Mitigation will be provided on private lands as identified by the Alameda County Conservation Partnership (ACCP). The ACCP is a joint project of the Alameda County Resource Conservation District and the Natural Resources Conservation Service (NRCS) that has crafted a streamlined permit process and implementation plan for improving and preserving special-status wildlife habitat on private ranch lands. The ACCP has identified approximately 25 deteriorating agricultural stock ponds throughout Alameda County that are in need of immediate repair to prevent complete failure and loss of wildlife habitat. The Department will ensure the restoration and preservation in perpetuity of wetlands and waters on these private lands. Upon restoration, conservation easements will be placed on all mitigation areas.

Restoration work is proposed to commence in the fall of 2006. In the event that mitigation goals at the Sweet Property cannot be provided on or before January 31, 2008, the remaining required mitigation at the Sweet Property, plus an additional one-fifth of that remaining required mitigation, shall be constructed prior to January 31, 2009. For every year of delay thereafter, the required amount of remaining off-site mitigation shall be increased by one-fifth, on an areal basis for seasonal wetlands, and on a linear foot basis for riparian waters. Construction of all off-site mitigation requirements shall be provided on or before January 31, 2010.

7. On-site wetlands and waters will be created and enhanced in the following areas, as the highway runs from the southwest to the northeast (station numbers correspond to the proposed roadway, and are in meters):
 - a. 0.05 acres of freshwater seasonal wetlands will be created between stations 58+80 and 60+80, where 0.24 of 0.60 acres of an old livestock stock pond are to be permanently filled. A new berm will be installed at the uphill end of the existing wetland area to allow additional ponding to the east and north.
 - b. 0.37 acres of shallow, freshwater seasonal wetlands will be created on the northeastern side of the proposed roadway, between stations 62+80 and 63+60. To accommodate the new wetlands, culverts will be removed at the existing location and the site will be graded to promote ponding. The new wetlands will drain into ephemeral tributaries of San Antonio Reservoir.
 - c. 0.47 acres of 1.22 acres of existing wetlands will be expanded by 0.27 acres at its southern and northern portions, between stations 67+00 and 68+80. The 1.22 acres of wetlands provide breeding habitat for the CTS and VPFS, and has been found to contain CTS larva and VPFS cysts. 0.75-acres of the wetlands will be permanently impacted by the proposed Project.
 - d. On-site creation of waters consists of filling and relocating an ephemeral creek channel from its existing location to the toe of a new slope where the slope intersects the bank of the existing creek. The proposed channel will be broken into four segments totaling 791 linear feet (0.18 acres) between stations 69+65 and 72+80. 220 linear feet are proposed to be unvegetated, rock-lined channels, and 571 linear feet are proposed to have a combination of natural and rock-lined bottom. Rock weirs will be placed within the channel at locations to create two freshwater seasonal wetland areas, as mentioned below in e and f. The area of the in-stream created wetlands will not be calculated into the linear feet or acreage totals for created freshwater seasonal creeks, but rather, totaled into the acreage totals for created seasonal freshwater wetlands.
 - e. 0.07-acres of freshwater seasonal wetlands are planned to be created immediately adjacent to the western side of the proposed roadway, between stations 70+10 and 70+40. The wetlands would lie adjacent to the former location of 0.12 acres of freshwater seasonal wetlands, which is proposed to be permanently impacted by the Project. The wetlands will be created between two in-stream rock weirs.
 - f. 0.05 acres of freshwater seasonal wetlands are proposed for the western side of the roadway, between stations 71+50 and 71+80. The wetlands will be created between two in-stream rock weirs.

To minimize impacts to the CTS, the Department will:

- Restrict construction around the CTS pond to a period when the pond is dry and there is not CTS breeding activity;
- Prohibit ground disturbance activities between October 31 and March 1 outside the limits of the established road bed; and,
- Work with the California Department of Fish and Game (CDFG) to find and relocate CTS one year prior to Project construction.

11. **California Red-Legged Frog:** The proposed Project is within critical habitat proposed for the CRLF by the USFWS. The Department has been given terms and conditions by the USFWS, in the Project's Biological Opinion issued February 28, 2005, and the Amendment to the Biological Opinion, dated April 27, 2005, to ensure the implementation of Reasonable and Prudent Measures to minimize Project impacts to the CRLF. To mitigate for the potential impacts to the CRLF, the Department has purchased 25 acres of CRLF habitat at the Ohlone Preservation Conservation Bank. A CRLF survey and relocation program will be completed on the Project site prior to the initiation of Project construction.
12. **Conservation Easement:** The Department shall submit a Final Mitigation and Monitoring Report (Final Mitigation Plan) that is acceptable to the Executive Officer, and that modifies the Draft Report. The Final Mitigation Plan will include how the mitigation lands are to be managed and preserved under the conservation easements. The long-term management of the mitigation sites will be provided using CDFG's model Conservation Easement (CE) as a template (see Attachment 1), and the management guidelines of the NRCS, acceptable to the Executive Officer. The CE shall identify the entities responsible for the long-term management of the mitigation sites. The accepted conservation easements shall be recorded not later than January 31, 2011, and within one year of the date of mitigation construction completion on any parcel with mitigation, whichever is earlier.
13. **Long-term Management:** This Order requires the Department to submit, prior to the start of Project construction, Property Analysis Records (PAR), or equivalent analyses estimating the endowment amounts necessary for the appropriate management, in perpetuity, of the mitigation areas. This Order requires these amounts be included as part of the Final Mitigation Plan.
14. **Post-construction stormwater management:** Operation of the reconfigured SR84 will impact beneficial uses through the discharge of stormwater containing automobile-related pollutants (e.g. oil, grease, heavy metals, etc.). To address the Project's post-construction impacts to beneficial uses, the Department proposed to install biofiltration strips along portions of the reconfigured SR 84. The strips would treat pollutants from approximately 12 acres, or 50% of the impervious surfaces within the Project limits.

Post-construction stormwater treatment controls (e.g., biofiltration strips) were not incorporated into the project design during the planning phase, but rather, the placement of treatment controls were evaluated for feasibility within the spatial limits of the final Project design. Consequently, the amount of impervious area that could be treated by stormwater

treatment controls is necessarily limited by the remaining available right-of-way within the Project area. Opportunities for treatment of roadway pollutants are further limited, given that portions of the proposed treatment controls are planned in areas subject to planned future roadway expansion. As such, to provide post-construction stormwater treatment to the maximum extent practicable, as required in State Water Resources Control Board Water Quality Order No. 99-06-DWQ, the NPDES Statewide Permit for Storm Water Discharges From the State of California Department of Transportation Properties, Facilities, and Activities (hereinafter Statewide Permit), the Department may collaborate with the City of Livermore (City) and the Alameda County Zone 7 Flood Control District (Zone 7) to provide for the treatment of dry weather urban runoff from approximately 1536 acres of existing residential and commercial areas discharging to the Arroyo Las Positas, nearby the Springtown Golf Course in the City of Livermore. The treatment would involve capture and filtration of dry-weather urban runoff through the use of a vegetated basin and swale(s). The Department would provide a water quality benefit equivalent to effectively treating 80 – 90% of average annual runoff from the SR84 Project site. Any additional treatment provided above that level of water quality benefit would be applied to future Department projects with stormwater requirements. Should this proposal prove infeasible, then the Department will provide alternate treatment, which may include treatment of stormwater runoff from the reconfigured SR84.

In the event that an arrangement cannot be reached between Zone 7 and the City, the Department shall provide the Water Board with alternate treatment that provides a water quality benefit equivalent to effectively treating 80 – 90% of average annual runoff from the Project.

15. **Hydromodification:** Project implementation will result in an increase of 14.2 acres of impervious surface. As a result, in comparison with the pre-Project conditions, stormwater runoff will be discharged from the Project site at greater volumes and over a shorter period of time following storm events. Consequently, operation of the Project will increase the potential for creek bed and bank erosion impacts downstream of the Project site.

The Department has submitted hydrologic data and analysis that represents changes in impervious surface and runoff coefficients for each watershed within the Project limits. Based upon an analysis of the data, the Department has concluded that changes in impervious surfaces will not result in significant hydromodification impacts downstream of the Project site. Based on a review of the submitted analyses and their underlying data, additional mitigation to address potential hydromodification impacts is not required in this Order.

16. On January 18, 2006, the Department submitted an initial application for Water Quality Certification and Waste Discharge Requirements for the Project. That application was subsequently completed by additional submittals.
17. The Water Board has determined to regulate the proposed discharge of fill materials into waters of the State by issuance of Waste Discharge Requirements (WDRs) pursuant to Section 13263 of the California Water Code (CWC) and 23 CCR §3857, in addition to issuing certification pursuant to 23 CCR §3859. The Water Board considers WDRs

necessary to adequately address impacts and mitigation to beneficial uses of waters of the State from this project, to meet the objectives of the California Wetlands Conservation Policy (Executive Order W-59-93), and to accommodate and require appropriate changes over the life of the project and its construction.

18. The Water Board, on June 21, 1995, adopted, in accordance with Section 13244 et seq. of the CWC, a revised Water Quality Control Plan, San Francisco Bay Basin (Basin Plan). This updated and consolidated revised Basin Plan was approved by the State Water Resources Control Board and the Office of Administrative Law on July 20, 1995, and November 13, 1995, respectively. A summary of regulatory provisions is contained in 23 CCR Section 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface waters and groundwaters. This Order is in compliance with the Basin Plan.
19. The subject wetlands, seasonal creeks, and other waters on the Project site are located in the South Bay Basin, and are tributaries to either Arroyo Valle, Vallecitos Creek, or San Antonio Reservoir. Vallecitos Creek is a tributary to Arroyo de la Laguna and Alameda Creek. The Basin Plan does not explicitly designate beneficial uses for waters on the Project site. However, the Basin Plan states that “[t]he beneficial uses of any specifically identified waterbody generally apply to all of its tributaries.” The following existing beneficial uses defined in the Basin Plan for identified waterbodies are:
- Agricultural supply (Alameda Creek);
 - Cold freshwater habitat (Alameda Creek, Arroyo Valle, San Antonio Reservoir);
 - Groundwater recharge (Alameda Creek, Arroyo de la Laguna, Arroyo Valle);
 - Fish migration (Alameda Creek, Arroyo de la Laguna);
 - Municipal and domestic water supply (Arroyo Valle, San Antonio Reservoir);
 - Water contact recreation (Alameda Creek, Arroyo de la Laguna,);
 - Non-contact water recreation (Alameda Creek, Arroyo de la Laguna, San Antonio Reservoir);
 - Fish spawning (Alameda Creek, Arroyo de la Laguna, Arroyo Valle, San Antonio Reservoir);
 - Warm freshwater habitat (Alameda Creek, San Antonio Reservoir); and,
 - Wildlife habitat (Alameda Creek, Arroyo de la Laguna, Arroyo Valle, San Antonio Reservoir).

Additionally, waters on the Project site provide habitat for the preservation of protected species, including the federally and state-listed threatened CRLF and CTS. The Project site also provides habitat for the federally-listed threatened VPFS.

20. The Basin Plan Wetland Fill Policy (policy) establishes that there is to be no net loss of wetland acreage and no net loss of wetland value, when the project and any proposed mitigation are evaluated together, and that mitigation for wetland fill projects is to be located in the same area of the Region, whenever possible, as the project. The policy further establishes that wetland disturbance should be avoided whenever possible, and if not possible, should be minimized, and only after avoidance and minimization of impact should mitigation for lost wetlands be considered.

21. The goals of the California Wetlands Conservation Policy (Executive Order W-59-93, signed August 23, 1993,) include ensuring “no overall loss” and achieving a “...long-term net gain in the quantity, quality, and permanence of wetland acreage and values...” Senate Concurrent Resolution No. 28 states that “[i]t is the intent of the legislature to preserve, protect, restore, and enhance California’s wetlands and the multiple resources which depend upon them for benefit of the people of the State.” Section 13142.5 of the CWC requires that the “[h]ighest priority shall be given to improving or eliminating discharges that adversely affect...wetlands, estuaries, and other biologically sensitive areas.”
22. With the successful implementation of the mitigation measures described in these findings and the provisions, the Water Board finds that the Project will comply with the California Wetlands Conservation Policy and Basin Plan Wetland Fill Policy referenced in Findings 20 and 21.
23. This Order applies to the temporary and permanent fill and indirect impacts to waters of the State associated with the Project, which is comprised of the components listed in Finding 1.
24. The Department has submitted an Alternatives Analysis to show that appropriate effort was made to avoid and then to minimize wetland disturbance, as required by the Basin Plan. Water Board and federal agency staff held additional discussions with the Department regarding its Alternatives Analysis. The Water Board concurs with the conclusions of the Alternatives Analysis.
25. Discharges of stormwater associated with construction activity will occur. The Department is responsible for obtaining appropriate permits for these discharges, including complying with the rules and regulations of National Pollutant Discharge Elimination System (NPDES) permit requirements. This includes complying with the requirements of its Statewide Permit.
26. Because of the Project’s proximity to sensitive resources, including special status species habitat, and potential to discharge materials that could significantly impact those resources, this Order requires the Department to submit a Storm Water Pollution Prevention Plan (SWPPP) for the Project, prepared pursuant to the provisions of its Statewide Permit, at least 60 days prior to the beginning of construction for the Project.
27. Discharges of ground water or other non-storm water during construction may be required. This Order considers such discharges covered by the Statewide Permit, contingent on submittal of an acceptable discharge plan at least 30 days prior to such a discharge.
28. The California Environmental Quality Act (CEQA) requires all projects approved by State agencies to be in full compliance with CEQA, and requires a lead agency to prepare an appropriate environmental document (e.g., Environmental Impact Report or Negative Declaration) for such projects. The Water Board has reviewed the Project’s environmental documents, and finds that all environmental impacts have been identified for the project activities it is required to approve, and that with compliance with the conditions of this Order, that mitigation measures and/or alternatives have been incorporated to reduce those

impacts to a level of insignificance. On April 19, 2005, the Department issued a Negative Declaration indicating that the Project would not have a significant impact on the environment.

29. The Department has applied to the U.S. Army Corps of Engineers (Corps) for an Individual Permit for the Project under Section 404 of the Clean Water Act.
30. In February 2005, the United States Fish and Wildlife Service (USFWS) issued a Biological Opinion, and an amendment in April 2005, for the Project (USFWS File No. 1-1-04-F-0115), finding that it is not likely to jeopardize the existence of either the CRLF, CTS, or the VPFS.
31. Pursuant to 23 CCR Sections 3857 and 3859, the Board is issuing WDRs and Water Quality Certification for the Project as described herein.
32. The Water Board has notified the Corps, Alameda County, the City of Livermore, the City of Pleasanton, USFWS, CDFG, and other interested agencies and persons of its intent to prescribe WDRs and Water Quality Certification for this discharge.
33. The Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.
34. Project files are maintained at the Water Board under file number 2199.9457 and site number 02-01-C0884.

IT IS HEREBY ORDERED that the Department, in order to meet the provisions contained in Division 7 of the California Water Code (CWC) and regulations adopted thereunder, shall comply with the following, pursuant to authority under CWC Sections 13263 and 13267:

A. Discharge Prohibitions

1. The direct discharge of wastes, including rubbish, refuse, bark, sawdust, concrete, asphalt, or other solid wastes into surface waters or at any place where they would contact or where they would be eventually transported to surface waters, including flood plains, is prohibited.
2. The discharge of floating oil or other floating materials from any activity in quantities sufficient to cause deleterious bottom deposits, turbidity, or discoloration in surface waters is prohibited.
3. The discharge of silt, sand, clay, or other earthen materials from any activity in quantities sufficient to cause deleterious bottom deposits, turbidity, or discoloration in surface waters is prohibited.
4. The wetland fill activities subject to these requirements shall not cause a nuisance as defined in CWC § 13050(m).

5. The discharge of decant water from active dredging or fill sites and dredged material/wet sediment stockpile or storage areas to surface waters or surface water drainage courses is prohibited, except as conditionally allowed following the submittal of a discharge plan or plans as described in the Provisions.
6. The groundwater in the vicinity of the Project shall not be degraded as a result of the Project activities or placement of fill for the Project.
7. The discharge of materials other than stormwater, which are not otherwise regulated by a separate NPDES permit or allowed by this Order, to waters of the State is prohibited.
8. The discharge of drilling muds to waters of the State, or where such muds could be discharged to waters of the State, is prohibited.

B. Receiving Water Limitations

1. The discharges shall not cause the following conditions to exist in waters of the State at any place:
 - a. Floating, suspended, or deposited macroscopic particulate matter or foam in concentrations that cause nuisance or adversely affect beneficial uses;
 - b. Bottom deposits or aquatic growths to the extent that such deposits or growths cause nuisance or adversely affect beneficial uses;
 - c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;
 - d. Visible, floating, suspended, or deposited oil or other products of petroleum origin; and
 - e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on wildlife, waterfowl, or other aquatic biota, or which render any of these unfit for human consumption, either at levels created in the receiving waters or as a result of biological concentration.
2. The discharges shall not cause nuisance, or adversely affect the beneficial uses of the receiving water.
3. The discharges shall not cause the following limits to be exceeded in waters of the State at any one place within one foot of the water surface:
 - a. Dissolved Oxygen: 5.0 mg/L, minimum

The median dissolved oxygen concentration for any three consecutive months shall not be less than 80% of the dissolved oxygen content at saturation. When natural factors cause concentrations less than that specified above, then the discharges shall not cause further reduction in ambient dissolved oxygen concentrations.

- c. pH: The pH shall not be depressed below 6.5 nor raised above 8.5, nor caused to vary from normal ambient pH by more than 0.5 pH units.
- e. Nutrients: Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

C. Provisions

1. The Department shall comply with all Prohibitions, Receiving Water Limitations, and Provisions of this Order immediately upon adoption of this Order or as provided below.
2. The Department shall submit copies of all necessary approvals and/or permits for the Project and mitigation projects from applicable government agencies, including, but not limited to, CDFG, USFWS, and the Corps, for each Project component applicable to that component, prior to the start of construction on that component.

Project Implementation Deadlines

3. Not later than 90 days following the adoption of the Order, the Department shall submit a Final Mitigation and Monitoring Plan that is acceptable to the Executive Officer, and that modifies the Draft Report and is consistent with the requirements of this Order, including dates and deadlines, and which provides for mitigation monitoring and maintenance until the regulatory agencies concur that the mitigation has been successfully completed. The Final Mitigation and Monitoring Plan shall not be deemed acceptable until the Department has received written notification of such acceptance from the Executive Officer. Similarly, the Department is responsible for monitoring and maintenance of Project mitigation until it has received a letter from the Executive Officer accepting the mitigation as complete. The Final Mitigation and Monitoring Plan must include a complete mitigation and monitoring plan for both the proposed on-site and off-site creek and seasonal wetland mitigation, including:
 - a. Planting plans and details for all on- and off-site mitigation, such as designs and construction drawings for in-stream structures, pond reconstructions, grading, planting, and irrigation plans, and all other information, as appropriate;
 - b. A minimum 5-year monitoring period for all wetland restoration activities, including creation and enhancement;

- c. A minimum 10-year monitoring period for all riparian restoration activities, including creation and enhancement;
- d. Performance standards and success criteria for mitigation;
- e. Specific locations and descriptions of reference sites to be used for evaluation of on-site and off-site mitigation success criteria;
- f. For the proposed mitigation locations, the proposed final conservation easements that identify, among other things, the entity or entities that will hold those easements after the monitoring period specified in 3.b and 3.c above;
- g. A finalized financial assurance proposal with all appropriate detail on financial assurances being provided to ensure the establishment and success, in perpetuity, of the proposed mitigation, and including appropriately detailed finalized estimates on the amount of the related financial assurances; and,
- h. A plan to ensure the restoration of temporarily disturbed areas on the Project site immediately following completion of construction in each section.

The Final Mitigation and Monitoring Plan may be amended subject to the review and approval of the Executive Officer. Project construction may not commence until the Final Mitigation and Monitoring Plan has been accepted in writing by the Executive Officer.

4. Not later than 90 days following the adoption of the Order, the Department shall provide, subject to the approval of the Executive Officer, a work plan identifying a timeline to implement the remaining mitigation requirements of this Order. The work plan should include dates for submission of all appropriate mitigation details.
5. The accepted conservation easements shall be recorded not later than January 31, 2011, and within one year of the date of mitigation construction completion on any parcel with mitigation, whichever is earlier.
6. To fully mitigate for proposed Project impacts, the Department shall ensure the successful creation and enhancement on-site of 791 and 1,510 linear feet, respectively, of freshwater seasonal creeks, and the creation of 0.92 acres of freshwater seasonal wetlands. Additionally, the Department shall ensure the successful restoration or creation of, at a minimum, 5.6 acres of freshwater seasonal wetlands, and the enhancement of 11,900 linear feet of freshwater seasonal creeks, to be completed no later than January 31, 2008. The 1,510 linear feet of on-site enhancement shall be applied towards the total required creek enhancement. If the Department cannot meet its off-site mitigation requirements on or before January 31, 2008, then additional mitigation requirements and implementation deadlines will apply, as described below in Provision 7. Additionally, the Water Board recognizes that some mitigation sites may also provide opportunities to complete preservation and enhancement of wetlands and waters. The Department may propose a creek and wetland mitigation package, acceptable to the Executive Officer, that substitutes preservation and enhancement for a portion of the required restoration and creation. Such substitution must be in all cases beyond the overall benefit provided by the wetland and creek restoration and creation required by this Order.

7. If all required off-site mitigation proposed in the Final Mitigation and Monitoring Plan as occurring in Fall 2006 through Fall 2007 (specifically, the creek enhancement, wetland creation, and related work on the Sweet property adjacent to Patterson Pass Road) is not constructed by January 31, 2008, the Department shall submit, subject to approval by the Executive Officer, a mitigation proposal to provide the balance of the remaining mitigation required on the Sweet property, plus an additional one-fifth of that remaining required mitigation, to be constructed prior to January 31, 2009. For every year of delay thereafter, the required amount of remaining off-site mitigation shall be increased by one-fifth, on an areal basis for seasonal wetlands, and on a linear foot basis for riparian waters.
8. Construction of all off-site mitigation shall be completed by January 31, 2010. Construction, not including monitoring and establishment, of all on-site mitigation requirements shall be completed within one year of Project construction completion. The Department shall notify the Executive Officer of the completed construction, by letter, not later than one week after construction has been completed.
9. Off-site mitigation shall be located within the Arroyo de la Laguna and Upper Alameda Creek sub-watersheds of the Alameda Creek Watershed, on sites that are also within Alameda County and within the boundaries of this Water Board.
10. Should the mitigation that the Department implements to satisfy the requirements of this Order result in a level of mitigation beyond what is required in this Order, in terms of quality, or in terms of implementation preceding the impacts they are mitigating for, the level of additional benefit may be applied as mitigation credit, subject to the approval of the Executive Officer, to this, or other Department projects impacting Waters of the State.
11. Not later than 90 days following adoption of the Order, the Department shall submit an updated alternate stormwater treatment proposal acceptable to the Executive Officer that includes all appropriate plans, calculations, narrative description of the proposal, design details, and related information. If a complete proposal cannot be submitted as identified above, then the Department shall submit a work plan for submitting all appropriate plans, calculations, narrative description of the proposal, design details, and related information, with deadlines for submittal of detailed plans and the completion of construction for the proposed stormwater controls. This proposal can be submitted as part of the Final Mitigation and Monitoring Plan, and shall include a level of treatment that has equivalent water quality benefit to effectively treating 80 – 90% of average annual runoff from the Project.
12. The Department shall fully implement any alternate stormwater treatment proposal prior to completion of the third stage of Project construction, as identified in Finding 2.
13. The Department shall submit annual mitigation monitoring reports acceptable to the Executive Officer no later than January 31 of each year until the mitigation sites have met their performance standards and final success criteria and the Executive Officer has accepted a notice of mitigation completion for each site, but for not less than a period of

five years and no less than a period of two years after any mitigation habitat irrigation systems have been terminated. If the mitigation and monitoring program indicates that establishment of the habitat is not progressing in a manner or rate consistent with the success criteria proposed and approved by the Executive Officer, the annual mitigation monitoring reports shall evaluate the probable cause(s) of any problems and propose appropriate corrective measures.

14. Not later than 60 days prior to commencement of each major phase of Project activities, as identified in Finding 2, the Department shall submit a schedule of Project implementation that includes the dates of impact, restoration, and/or creation as well as areas and lengths, of wetlands and waters to be temporarily and permanently impacted, restored, and/or created. The Department shall notify the Water Board immediately upon deviation from the submitted schedule of implementation.
15. Following the end of each construction season (April 1 – October 31), and no later than December 31, the Department shall provide an updated summary detailing the extent of impacts to wetlands and waters, with dates and waterbodies identified, as well as areas that have been restored during that year.
16. Not later than 60 days prior to the beginning of construction of any Project component, the Department shall submit, acceptable to the Executive Officer, a final SWPPP, prepared pursuant to its Statewide Permit, to address the Project's expected construction stage impacts.
17. As-built plans for the mitigation sites shall be prepared and submitted to the Water Board within 90 days of the completion of mitigation site construction.
18. The portion of the mitigation activities that will be scheduled to be completed prior to January 31, 2008 shall be identified in the Final Mitigation and Monitoring Plan. Identification of these activities shall include site location and detailed design plans, wetland acreage, linear feet of riparian restoration and preservation, and other appropriate details.
19. No construction shall occur within 150 feet of any Waters of the State, on any Project component, until off-site pond and riparian restoration mitigation activities identified in the approved Final Mitigation and Monitoring Plan as being planned prior to construction (specifically, the creek enhancement, wetland creation, and related work on the Sweet property adjacent to Patterson Pass Road) are in a stage of active construction.
20. The Department shall ensure the purchase of at least 2.06 acres of VPFS habitat, and 80 credit acres of CTS habitat, pending USFWS identification of appropriate habitat, prior to October 1, 2010, at a location or locations subject to the approval of the Executive Officer.

Other Provisions

21. Any substantive modifications to the Final Mitigation and Monitoring Plan or other documents referenced in the Provisions must be approved in writing by the Executive Officer, prior to implementation of the modification.
22. All Reports pursuant to these Provisions shall be prepared under the supervision of suitable professionals registered in the State of California, if such registration is required or offered in the profession of the subject field.
23. The Department shall immediately notify the Board staff by telephone whenever an adverse condition occurs as a result of this discharge. Such a condition includes, but is not limited to, a violation of the conditions of this Order, a significant spill of petroleum products or toxic chemicals, or damage to control facilities that would cause noncompliance. Pursuant to CWC §13267(b), a written notification of the adverse condition shall be submitted to the Water Board within two weeks of occurrence. The written notification shall identify the adverse condition, describe the actions necessary to remedy the condition, and specify a timetable, subject to any modifications by the Water Board staff, for the remedial actions.
24. The Department shall at all times fully comply with the engineering plans, specifications, and technical reports submitted with its application for water quality certification and the completed report of waste discharge.
25. All discharges of ground water or other non-storm water during construction are covered under the Statewide Permit, contingent on submittal of an acceptable discharge plan at least 30 days prior to such a discharge.
26. The Department is considered to have full responsibility for correcting any and all problems that arise in the event of a failure that results in an unauthorized release of waste or wastewater.
27. Any hazardous, designated or non-hazardous waste as defined in Title 23, Division 3, Chapter 15 of the California Administrative Code, shall be disposed of in accordance with applicable state and federal regulations.
28. The Department shall clean up and abate any wastes that are discharged at any sites in violation of this Order.
29. In accordance with CWC §13260, the Discharger shall file with the Water Board a report of any material change or proposed change in the ownership, character, location, or quantity of this waste discharge. Any proposed material change in operation shall be reported to the Executive Officer at least 30 days in advance of the proposed implementation of any change. This shall include, but not be limited to, all significant new soil disturbances, all proposed expansion of development, or any change in drainage characteristics at the Project site. For the purpose of this Order, this includes any

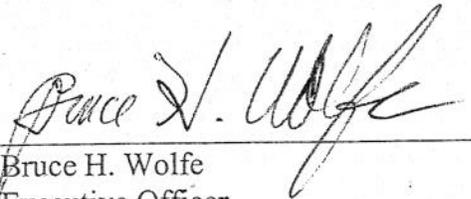
proposed change in the boundaries of the area of wetland/waters of the United States to be filled.

30. The following standard conditions apply to this Order:
 - a. Every certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to CWC §13330 and 23 CCR §3867.
 - b. Certification is not intended and shall not be construed to apply to any activity involving a hydroelectric facility and requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent certification application was filed pursuant to 23 CCR §3855(b) and that application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.
 - c. Certification is conditioned upon total payment of any fee required pursuant to 23 CCR §3833 and owed by the Department.
31. An annual fee for Waste Discharge Requirements pursuant to Section 13260 of the California Water Code is required and shall be paid by the Department in a timely manner.
32. The Department shall maintain a copy of this Order at the Project site so as to be available at all times to site operating personnel and agencies.
33. The Department shall permit the Water Board or its authorized representative at all times, upon presentation of credentials:
 - a. Entry onto Project premises, including all areas on which wetland fill or wetland mitigation is located or in which records are kept.
 - b. Access to copy any records required to be kept under the terms and conditions of this Order.
 - c. Inspection of any treatment equipment, monitoring equipment, or monitoring method required by this Order.
 - d. Sampling of any discharge or surface water covered by this Order.
34. This Order does not authorize commission of any act causing injury to the property of another or of the public; does not convey any property rights; does not remove liability under federal, state, or local laws, regulations or rules of other programs and agencies, nor does this Order authorize the discharge of wastes without appropriate permits from

other agencies or organizations.

35. The Water Board will consider rescission of this Order upon Project completion and the Executive Officer's acceptance of notices of completion of mitigation for all mitigation, creation, and enhancement projects required or otherwise permitted now or subsequently under this Order.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, complete, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on May 10, 2006.



Bruce H. Wolfe
Executive Officer



California Department of Fish and Game
Bay Delta Region
7329 SILVERADO TRAIL
NAPA, CALIFORNIA 94558

California Endangered Species Act
Incidental Take Permit No. 2081-2010-029-03

SWEET RANCH MITIGATION PROJECT

Authority: This California Endangered Species Act (CESA) Incidental Take Permit (ITP) is issued by the Department of Fish and Game (DFG) pursuant to Fish and Game Code section 2081, subdivisions (b) and (c), and California Code of Regulations, Title 14, section 783.0 et seq. CESA prohibits the take¹ of any species of wildlife designated by the California Fish and Game Commission as an endangered, threatened, or candidate species.² DFG, however, may authorize the take of any such species by permit if the conditions set forth in Fish and Game Code section 2081, subdivisions (b) and (c) are met. (See also Cal. Code Regs., tit. 14, § 783.4.)

Permittee: California Department of Transportation

Principal Officer: Margaret Gabil, Senior Environmental Planner, (510)286-6222

Contact Person: Laura Ivey, Office of Biological Sciences and Permits, (510)286-1357

Mailing Address: 111 Grand Avenue, Mail Station 8-E
Oakland, California 94612

Effective Date and Expiration Date of this ITP:

This ITP shall be executed in duplicate original form and shall become effective once a duplicate original is acknowledged by signature of the Permittee on the last page of this ITP and returned to DFG's Habitat Conservation Planning Branch at the address listed in the Notices section of this ITP. Unless renewed by DFG, this ITP's authorization to take the Covered Species shall expire on **October 15, 2015**.

Notwithstanding the expiration date on the take authorization provided by this ITP, Permittee's obligations pursuant to this ITP do not end until DFG accepts as complete the Permittee's Final Mitigation Report required by Condition 7.7 of this ITP.

¹Pursuant to Fish and Game Code section 86, "'Take' means hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill."

²"Candidate species" are species of wildlife that have not yet been placed on the list of endangered species or the list of threatened species, but which are under formal consideration for listing pursuant to Fish and Game Code section 2074.2.

Project Location:

The Project is located at the Sweet Ranch Mitigation Site which is approximately 6 miles east of downtown Livermore at the intersection of Cross and Patterson Pass Roads, 2.2 miles southeast of the Interstate 580/Greenville Road Undercrossing in the County of Alameda, California.

Project Description:

The California Department of Transportation (Caltrans) proposes to construct wetland mitigation for the completed State Route 84 Pigeon Pass Safety Project, at the Sweet Ranch Mitigation Site in Alameda County, California (Project). The wetland mitigation is to satisfy the requirements of other agencies, not DFG. Sweet Ranch is a working ranch proposed to be conserved with an as yet unrecorded conservation easement pursuant to Government Code 65965. Habitat restoration activities at the Sweet Ranch Conservation Site were split between Phase I and Phase II. This ITP only addresses Phase II restoration, which includes wetland mitigation and riparian restoration activities. Phase I was completed in December 2007, prior to protection of California tiger salamander pursuant to CESA. Information pertaining to Phase I has been included to provide a context for Phase II wetland mitigation activities.

Wetland Mitigation Phase I - Completed

During Phase I, a pond with dimensions of approximately 25 feet by 50 feet was constructed near the western seep of Sweet Ranch and was filled by the 2007 fall/winter rains. Designed to provide breeding habitat for the California tiger salamander, the newly created pond constituted 0.1 acre of seasonal wetland habitat mitigation for the Pigeon Pass Project. In addition, Caltrans purchased California tiger salamander mitigation credits at Ohlone Mitigation Bank to satisfy United States Fish and Wildlife Service (USFWS) required California tiger salamander mitigation for the Pigeon Pass Project; therefore, no additional California tiger salamander mitigation was necessary to satisfy permit requirements for the Pigeon Pass Project. Surveys conducted in 2010, confirmed the presence of California tiger salamander larvae in the pond constructed by Caltrans at Sweet Ranch. Surveys in 2010 could not confirm the number of larvae present within the mitigation pond, but visual observations estimated that several hundred individual California tiger salamander larvae may have been present. The installation of this pond provides significant breeding habitat, since prior to its installation, the site lacked suitable California tiger salamander breeding habitat.

Wetland Mitigation Phase II -- Proposed Activities

Phase II activities will include wetland and riparian improvements at Sweet Ranch. Phase II activities are anticipated to begin in May of 2011. The completed Project will result in the installation of 4 acres of seasonal wetlands, 4.7 acres of restored/enhanced mixed riparian habitat, and 2.4 acres of improved bed and bank.

Incidental Take Permit
No. 2081-2010-029-03
CALIFORNIA DEPARTMENT OF TRANSPORTATION
SWEET RANCH MITIGATION PROJECT

Phase II activities for the Sweet Ranch Mitigation Project include five components: wetland creation, riparian creation and restoration, grade stabilization, culvert improvements, and ranch infrastructure. Ranch infrastructure includes fencing to limit cattle access to the mitigation site, and development of a water supply. Phase II is divided into Part I, which includes the contour grading of the wetlands, and Part II, which involves installing boulder weirs and riparian planting, and removing exotic species along the creek channel. Construction for Part I will start May 1, 2011, while Part II will start in summer 2011, with planting being installed during the fall.

Bowl Area Wetland Creation

The design for the creation of seasonal wetlands includes a series of shallow terraces lined with a geosynthetic clay-liner. Bentonite seals will be installed to allow short term retention of runoff water from an approximately 5-acre watershed. Because the existing grade of the basin is steeply sloped, a stepped design will be used to increase water retention time so that soils within the terraces will remain saturated for a period of 14 days or more to achieve wetland hydrology. The terraces will be seeded and planted with native vegetation, and approximately one acre of seasonal wetland will be created.

The series of three terraces will be approximately 50 feet from back to front, and will be vertically separated by five feet, but widths will vary to accommodate the natural contour and allow for final grades to conform to the original grades and blend with the natural topography of the basin. Geosynthetic clay liner material will be installed above a prepared subgrade for each terrace, and seams will be sealed with Bentonite to ensure the integrity of the liner across the entire surface of each terrace. Sloped earthen embankments will divide the terraces, and spillways constructed of rock slope protection (RSP) with filter fabric lining will provide a drainage pathway for water runoff.

The wetland vegetation and initial erosion control will be accomplished through installation of hydroseed mix containing both sterile, quick growing species to address immediate needs for erosion control, and native, hydrophytic plant species that are expected to thrive in the moist soils.

Best Management Practices such as compost blankets, fiber rolls, and hydroseed will be installed to protect embankments, which provide structure to the terraced wetlands from erosion. Plastic netting will not be used, only natural fibers such as coir and jute will be used. The boundaries of wetland construction areas will be marked with temporary fencing during wetland creation activities to prevent cattle from grazing the wetland. Permanent fencing will be constructed using metal T-posts and five strands of barbed wire.

Wet Meadow

A wet meadow will be created at the gently sloping field at the western reach of the intermittent stream immediately upstream of Cross Road. This meadow will be created by

re-grading the field and existing channel, and constructing a series of four terraces separated by earthen berms. Rock lined drop structures will be installed as spillways between the terraced, ponding areas. Wetland areas will be seeded and planted with appropriate native plants. Approximately three acres of wetland will be created at this location.

The four terraces will be installed along the line of an existing drainage ditch that currently directs natural runoff from a culvert under an existing ranch road on the east side of the field, to a culvert under Cross Road. The terraces and connecting spillways are intended to replace the existing drainage ditch, and will increase the retention time of water passing through the field, and also increase the size of the saturated soil area. The structure of the four terraces will vary from 25 to 75 feet from back to front, with vertical separation varying from 2.5 feet to 5 feet, and widths varying from 150 to 300 feet.

Boulder Weirs

Installation of seven low boulder-weirs (1/2 to 1-ton rock) is proposed within the wet meadow and bowl area to prevent further down-cutting. The rock will be sized and placed to interlock, and will cover approximately 400 square feet of channel. The weirs will be placed in the channel at locations that exhibit down-cutting and where the immediate upstream channel profile is fairly level. The boulder structures will allow some water to back up, potentially increasing the area of stream channel saturation directly upstream, while allowing water to flow through the structure.

Riparian Restoration

The riparian habitat condition of approximately 810 linear feet of stream and stream bank will be enhanced through planting of native vegetation, and the removal of exotic species and man-made debris that has accumulated along 2,000 linear feet of the watercourse.

The stream and stream banks are vegetated with annual grasslands and weedy vegetation, a result of cattle grazing over many years. Approximately 810 linear feet of stream and stream bank that lack native hydrophytic vegetation will be replanted with locally occurring riparian species, e.g. arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*) and blue elderberry (*Sambucus mexicana*). Willows will be used along the lower portions of the banks, while transitional species, such as blue elderberry, will be planted along the upper banks.

A planting plan is being developed that will include details about the species mix and planting locations. An irrigation system will be installed to provide supplemental irrigation, as needed, for three years. A gated fence will be installed along both sides of the riparian corridor to exclude livestock until plants become sufficiently established to withstand grazing, and to allow controlled grazing thereafter.

Within the 4,810 linear feet eastern reach, approximately 2,000 linear feet of the eastern reach will be enhanced by removing exotic species and debris. This area has an understory dominated by cape ivy (*Delairea odorata*), periwinkle (*Vinca major*), and similarly undesirable

invasive exotic species. Two eucalyptus trees were removed from this area during Phase I. Another dozen non-native trees on an adjacent property are proposed for removal during Phase II, if an agreement can be reached with the landowner.

Exotic species removal will be accomplished with a combination of mechanical and manual techniques, and by application of the herbicide Rodeo (glyphosate), used in compliance with the federal injunction for this herbicide. This herbicide is needed to control the extensive cover of cape ivy and periwinkle in the riparian corridor. Herbicides will be applied between May 1 and October 31, and will not be applied within 72 hours of forecasted precipitation. All exotic vegetation removed manually will be hauled away and disposed of at a green-waste facility.

Debris (e.g., wire rolls, old tires, appliances, old farm equipment, etc.) will be removed from the channel and hauled off site and disposed of at an appropriate waste/recycling facility.

Culverts

A culvert that currently crosses under the unpaved driveway behind an existing house will be replaced with twin 36-inch diameter culverts to accommodate a 100-year storm event. The current culvert is undersized, and as a result it has failed to function properly, causing much of the erosion in this area of the creek. Replacing it with adequately sized culverts will minimize erosion and improve the hydrologic conditions of the creek.

An existing roadside culvert along Patterson Pass Road is causing erosion on the creek's north bank. To address erosion at this location, the culvert will be extended approximately 150 linear feet and placed through an existing gully. The culvert extension will discharge to a rocked, plunge-pool dissipater adjacent to the streambed.

Fencing

Approximately one mile of boundary and pasture fencing (five-strand barbed wire) will be installed to temporarily exclude livestock from created wetlands, existing seeps, and new plantings. Access of cattle to the wetlands may be allowed in the future, if grazing serves habitat management goals.

Access Road

The existing ranch access road will be graded and improved with drainrock to reduce erosion, and to allow vehicle access for monitoring and conducting repairs in wet weather.

Corral

The Sweet Ranch conservation property will use cattle grazing as one method of range management. New corrals made from portable fence panels and a chute for working livestock will be installed near the staging area where a dilapidated barn was recently removed.

Water Supply System

An existing seep is located at the eastern end of the Project site. The seep is fenced and currently provides water for livestock. A pipeline will be added to the existing developed seep to supply water for the temporary irrigation system that will service the restoration plantings. Additional livestock troughs will also be added to the system.

Covered Species Subject to Take Authorization Provided by this ITP:

This ITP covers the following species:

Name	CESA Status ³
1. California tiger salamander (<i>Ambystoma californiense</i>)	Threatened ⁴

This species and only this species is hereinafter referred to as "Covered Species."

Impacts of the Taking on Covered Species:

Project activities and their resulting impacts are expected to result in the incidental take of individuals of the Covered Species. California tiger salamander larvae have been observed within the Sweet Ranch Mitigation Site, both at vernal pools and in the mitigation pond. From these observations and from additional recent sightings within one mile of the mitigation site, it is highly likely that California tiger salamander are present year-round in the area. The activities described above that are expected to result in incidental take of individuals of the Covered Species include equipment traffic and earth disturbing activities associated with the construction of the wetlands, spillways, boulder weirs, culverts, dissipater, fencing and corral installation (Covered Activities). Covered Species may occur from the Covered Activities in the form of mortality ("kill") and also in the form of catch, capture, or attempt to do so from relocation activities authorized by this ITP. Take could occur in any of the locations of planned Covered Activities (Project Area).

Given the potential for California tiger salamander to occur in burrows up to 3.2 feet below ground, salamanders in deep burrows would remain undetected within the excavation sites, and could be subject to direct mortality during ground disturbing work. Incidental take of California tiger salamanders may be difficult to detect, because this amphibian is most often located underground. Individuals spend limited periods above ground, where they occupy breeding ponds, forage, and migrate between pools and burrows. The opportunity to detect mortality on the surface is also limited, because although the burrows may be located a distance from the breeding ponds, and require travel overland, the migrations occur during rainy nights in the fall, winter, or spring. Finding individuals is unlikely because of their relatively small body size and cryptic coloration. Losses in this species also may be difficult

³Under CESA, a species may be on the list of endangered species, the list of threatened species, or the list of candidate species. All other species are "unlisted."

⁴See Cal. Code Regs. tit. 14 § 670.5, subd. (b)(3)(G).

to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at breeding ponds, or additional environmental disturbance. Therefore, despite best efforts to relocate California tiger salamanders prior to Covered Activities, it is estimated that all California tiger salamanders inhabiting the anticipated 4.3-acre area of ground disturbance will be subject to incidental take.

Habitat Loss

Upland burrows currently in the Project Area may be inhabited by aestivating California tiger salamanders during the dry season, when construction is scheduled to occur, and will be permanently impacted by construction of the wetlands, spillways, boulder weirs, culverts, and dissipater. After pre-construction surveys and relocation of any California tiger salamanders found in burrows, underground refugia located within these areas of ground disturbance will be destroyed during excavation. Additionally, the conversion of upland habitat to wetlands with a proposed 14 day hydroperiod, represents a permanent impact to California tiger salamander foraging and aestivation habitat, and could cause potential take due to lack of suitable hydroperiod required for breeding and metamorphosis. Accordingly, the area of permanent California tiger salamander habitat impacts anticipated from the construction of this project totals 4.3 acres.

Incidental Take Authorization of Covered Species:

This ITP authorizes incidental take of the Covered Species and only the Covered Species. With respect to incidental take of the Covered Species, DFG authorizes the Permittee, its employees, contractors, and agents to take Covered Species incidentally in carrying out the Covered Activities, subject to the limitations described in this section and the Conditions of Approval identified below. This ITP does not authorize take of Covered Species from activities outside the scope of the Covered Activities, take of Covered Species outside of the Project Area, take of Covered Species resulting from violation of this ITP, or intentional take of Covered Species (except for capture and relocation of Covered Species as authorized by this ITP).

Conditions of Approval:

Unless specified otherwise, the following measures shall pertain to all Covered Activities within the Project Area, including areas used for vehicular ingress and egress, staging and parking, and noise and vibration generating activities that may cause take. DFG's issuance of this ITP and Permittee's authorization to take the Covered Species are subject to Permittee's compliance with and implementation of the following Conditions of Approval:

1. Legal Compliance. Permittee shall comply with all applicable State, federal, and local laws in existence on the effective date of this ITP or adopted thereafter.
2. CEQA Compliance. Permittee shall implement and adhere to the mitigation measures related to the Covered Species in the Biological Resources section of the State Route

84 Realignment and Widening Initial Study/Environmental Assessment (SCH Number: 2004062018) certified by the lead agency, California Department of Transportation, for the Project pursuant to the California Environmental Quality Act (CEQA) on April 27, 2005.

3. LSA Agreement Compliance. Permittee shall implement and adhere to the mitigation measures and conditions related to the Covered Species in the Lake and Streambed Alteration (LSA) agreement (notification number 1600-2006-0059-R3) for the Project pursuant to Fish and Game Code section 1602 et seq.
4. ESA Compliance. Permittee shall implement and adhere to the terms and conditions related to the Covered Species in the Reinitiation of Consultation of the Biological Opinion for the State Route 84 Pigeon Pass Curve Realignment Project, Alameda County, California (Service File No. 1-1-04-F-0115) for the Inclusion of Phase II of Mitigation Activities at Sweet Ranch, Livermore, California, for the Project pursuant to the Federal Endangered Species Act (ESA), unless those terms and conditions are less protective of the Covered Species or conflict with the conditions of this ITP.
5. ITP Time Frame Compliance. Permittee shall fully implement and adhere to the conditions of this ITP within the time frames set forth below and as set forth in the Mitigation Monitoring and Reporting Program (MMRP), which is included as Attachment 1 to this ITP.

6. General Provisions:

- 6.1. Designated Representative. Before starting Covered Activities, Permittee shall designate a representative (Designated Representative) responsible for communications with DFG and overseeing compliance with this ITP. Permittee shall notify DFG in writing before starting Covered Activities of the Designated Representative's name, business address, and contact information, and shall notify DFG in writing if a substitute Designated Representative is selected or identified at any time during the term of this ITP.
- 6.2. Designated Biologist. Permittee shall submit to DFG in writing the name, qualifications, business address, and contact information of a biological monitor (Designated Biologist) at least 30 days before starting Covered Activities. Permittee shall ensure that the Designated Biologist is knowledgeable and experienced in the biology and natural history of the Covered Species. The Designated Biologist shall be responsible for monitoring Covered Activities to help minimize and fully mitigate or avoid the incidental take of individual Covered Species and to minimize disturbance of Covered Species' habitat. Permittee shall obtain DFG approval of

the Designated Biologist in writing before starting Covered Activities, and shall also obtain approval in advance in writing if the Designated Biologist must be changed.

- 6.3. Designated Biologist Authority. To ensure compliance with the Conditions of Approval of this ITP, the Designated Biologist shall have authority, working through the Resident Engineer, to immediately stop any activity that is not in compliance with this ITP, and/or to order any reasonable measure to avoid the unauthorized take of an individual of the Covered Species, or a species not covered by this ITP.
- 6.4. Education Program. Permittee shall conduct an education program for all persons employed or otherwise working in the Project Area before performing any work. The program shall consist of a presentation from the Designated Biologist that includes a discussion of the biology and general behavior of the Covered Species, information about the distribution and habitat needs of the Covered Species, sensitivity of the Covered Species to human activities, its status pursuant to CESA including legal protection, recovery efforts, penalties for violations and Project-specific protective measures described in this ITP. Permittee shall provide interpretation for non-English speaking workers, and the same instruction shall be provided for any new workers before their performing work in the Project Area. Permittee shall prepare and distribute wallet-sized cards or a fact sheet handout containing this information for workers to carry in the Project Area. Upon completion of the program, employees shall sign a form stating they attended the program and understand all protection measures.
- 6.5. Construction Monitoring Notebook. The Designated Biologist shall maintain a construction-monitoring notebook on-site throughout the construction period which shall include a copy of this ITP with attachments and a list of signatures of all personnel who have successfully completed the education program. Permittee shall ensure a copy of the construction-monitoring notebook is available for review at the Project site upon request by DFG.
- 6.6. Trash Abatement. Permittee shall initiate a trash abatement program before starting Covered Activities and shall continue the program for the duration of the Project. Permittee shall ensure that trash and food items are contained in closed (animal-proof) containers and removed regularly (at least once a week) to avoid attracting opportunistic predators such as ravens, coyotes, and feral dogs.
- 6.7. Dust Control. Permittee shall implement dust control measures during Covered Activities to facilitate visibility for monitoring of the Covered Species by the Designated Biologist. Permittee shall keep the amount of water used to the minimum amount needed, and shall not allow water to form puddles.

- 6.8. Erosion Control Materials. Permittee shall prohibit use of erosion control materials potentially harmful to Covered Species and other species, such as mono-filament netting (erosion control matting) or similar material, in potential Covered Species' habitat.
- 6.9. Firearms and Dogs. Permittee shall prohibit firearms and domestic dogs from the Project Area and site access routes during Covered Activities, except those in the possession of authorized security personnel or local, State, or federal law enforcement officials.
- 6.10. Delineation of Property Boundaries. Before starting Covered Activities Permittee shall clearly delineate the boundaries of the Project Area with fencing, stakes or flags. Permittee shall restrict all Covered Activities to within the fenced, staked or flagged areas. Permittee shall maintain all fencing, stakes and flags until the completion of Covered Activities in that area.
- 6.11. Delineation of Habitat. Permittee shall clearly delineate habitat of the Covered Species within the Project Area with high visibility Environmentally Sensitive Area fencing and posted signs as necessary to minimize the disturbance of Covered Species' habitat.
- 6.12. Project Access. Project-related personnel shall access the Project Area using existing routes, or routes identified in the Project Description, and shall not cross Covered Species' habitat outside of or en route to the Project Area. Permittee shall restrict Project-related vehicle traffic to established roads, staging, and parking areas. Permittee shall ensure that vehicle speeds do not exceed 20 miles per hour to avoid Covered Species on or traversing the roads. If Permittee determines construction of routes for travel are necessary outside of the Project Area, the Designated Representative shall contact DFG for written approval before carrying out such an activity. DFG may require an amendment to this ITP if additional take of Covered Species may result from Project modification.
- 6.13. Staging Areas. Permittee shall confine all Project-related parking, storage areas, laydown sites, equipment storage, and any other surface-disturbing activities to the Project Area using, to the extent possible, previously disturbed areas. Additionally, Permittee shall not use or cross Covered Species' habitat outside of the marked Project Area.
- 6.14. Hazardous Waste. Permittee shall immediately stop and following pertinent State and federal statutes and regulations arrange for repair and clean up by qualified individuals of any fuel or hazardous waste leaks or spills at the time of occurrence, or as soon as it is safe to do so. Permittee shall exclude the storage and handling

of hazardous materials from the Project Area and shall properly contain and dispose of any unused or leftover hazardous products off-site.

6.15. DFG Access. Permittee shall provide DFG staff with reasonable access to the Project, and shall otherwise fully cooperate with DFG efforts to verify compliance with or effectiveness of mitigation measures set forth in this ITP.

6.16. Refuse Removal. Upon completion of Covered Activities, Permittee shall remove from the Project Area and properly dispose of all temporary fill and construction refuse, including, but not limited to, broken equipment parts, wrapping material, cords, cables, wire, rope, strapping, twine, buckets, metal or plastic containers, and boxes.

7. Monitoring, Notification and Reporting Provisions:

7.1. Notification Before Commencement. The Designated Representative shall notify DFG 14 calendar days before starting Covered Activities and shall document compliance with all pre-Project Conditions of Approval before starting Covered Activities.

7.2. Notification of Non-compliance. The Designated Representative shall immediately notify DFG in writing if it determines that the Permittee is not in compliance with any Condition of Approval of this ITP, including but not limited to any actual or anticipated failure to implement measures within the time periods indicated in this ITP and/or the MMRP. The Designated Representative shall report any non-compliance with this ITP to DFG within 24 hours.

7.3. Compliance Monitoring. The Designated Biologist shall be on-site daily when Covered Activities occur. The Designated Biologist shall conduct compliance inspections to (1) minimize incidental take of the Covered Species; (2) check for compliance with all measures of this ITP; (3) check all exclusion zones; and (4) ensure that signs, stakes, and fencing are intact, and that Covered Activities are only occurring in the Project Area. The Designated Representative or Designated Biologist shall prepare daily written observation and inspection records summarizing: oversight activities and compliance inspections, observations of Covered Species and their sign, survey results, and monitoring activities required by this ITP.

7.4. Quarterly Compliance Report. The Designated Representative or Designated Biologist shall compile the observation and inspection records identified in Condition 7.3 into a Quarterly Compliance Report and submit it to DFG along with a copy of the MMRP table with notes showing the current implementation status of each

mitigation measure. Quarterly Compliance Reports shall be submitted to DFG's Regional Office at the office listed in the Notices section of this ITP and via e-mail to DFG's Regional Representative. At the time of this ITP's approval, the DFG Regional Representative is Marcia Grefsrud (mgrefsrud@dfg.ca.gov). DFG may at any time increase the timing and number of compliance inspections and reports required under this provision depending upon the results of previous compliance inspections. If DFG determines the reporting schedule must be changed, DFG will notify Permittee in writing of the new reporting schedule.

- 7.5. Annual Status Report. Permittee shall provide DFG with an Annual Status Report (ASR) no later than January 31 of every year beginning with issuance of this ITP and continuing for 10 years and until DFG accepts the Final Mitigation Report identified below. Each ASR shall include, at a minimum: (1) a summary of all Quarterly Compliance Reports for that year identified in Condition 7.4; (2) a general description of the status of the Project Area and Covered Activities, including actual or projected completion dates, if known; (3) a copy of the table in the MMRP with notes showing the current implementation status of each mitigation measure; (4) an assessment of the effectiveness of each completed or partially completed mitigation measure in avoiding, minimizing and mitigating Project impacts; (5) all available information about Project-related incidental take of the Covered Species; and (6) information about other Project impacts on the Covered Species.
- 7.6. CNDDDB Observations. The Designated Biologist shall submit all observations of Covered Species to DFG's California Natural Diversity Database (CNDDDB) and the Designated Biologist shall include copies of the submitted forms with the next Quarterly Compliance Report or ASR, whichever is submitted first relative to the observation.
- 7.7. Final Mitigation Report. The mitigation monitoring for this project shall last for 10 years. No later than 45 days after completion of all mitigation measures, Permittee shall provide DFG with a Final Mitigation Report. The Designated Biologist shall prepare the Final Mitigation Report which shall include, at a minimum: (1) a summary of all Quarterly Compliance Reports and all ASRs; (2) a copy of the table in the MMRP with notes showing when each of the mitigation measures was implemented; (3) all available information about Project-related incidental take of the Covered Species; (4) information about other Project impacts on the Covered Species; (5) beginning and ending dates of Covered Activities; (6) an assessment of the effectiveness of this ITP's Conditions of Approval in minimizing and fully mitigating Project impacts of the taking on Covered Species; (7) recommendations on how mitigation measures might be changed to more effectively minimize take and mitigate the impacts of future projects on the Covered Species; and (8) any other pertinent information.

- 7.8. Notification of Take. Permittee shall immediately notify the Designated Biologist if a Covered Species is killed or taken by a Project-related activity, or if a Covered Species is otherwise found dead or injured within the vicinity of the Project. The Designated Biologist or Designated Representative shall provide initial notification to DFG by calling the Regional Office at (707) 944-5520. The initial notification to DFG shall include information regarding the location, species, number of animals taken and the ITP Number. Following initial notification, Permittee shall send DFG a written report within two calendar days. The report shall include the date and time of the finding or incident, location of the animal or carcass, and if possible provide a photograph, explanation as to cause of take, and any other pertinent information.

8. Take Minimization Measures:

The following requirements are intended to ensure the minimization of incidental take of Covered Species in the Project Area during Covered Activities. Permittee shall implement and adhere to the following conditions to minimize take of Covered Species:

- 8.1. Work Period. Permittee shall confine all work within areas of potential Covered Species habitat, to the period of April 15th to October 31st.
- 8.2. Pre-construction Surveys. Prior to Permittee beginning Covered Activities, the Designated Biologist shall conduct pre-construction surveys for California tiger salamanders. These surveys shall consist of walking surveys of the project limits and adjacent areas accessible to the public to determine presence of the species.
- 8.3. Weather Monitoring. Permittee and the Designated Biologist shall monitor the National Weather Service 72-hour forecast for the Project Area. If rain is predicted within 72 hours during the Project, all Covered Activities shall cease until no further rain is forecast. If the ponds/pools remain dry after the rain, the Permittee may continue activities.
- 8.4. Daily Work Window. Permittee shall cease all Covered Activities one half hour before sunset and shall not begin Covered Activities prior to one half hour before sunrise. Except when necessary for construction, driver or pedestrian safety, lighting of the Project Area by artificial lighting during nighttime hours should be minimized to the maximum extent practicable.
- 8.5. Covered Species Relocation. The Designated Biologist shall relocate any Covered Species found within the Project Area during Covered Activities to an active rodent burrow system located no more than 300 feet outside of the Project Area boundary unless otherwise approved by DFG. The Designated Biologist shall identify all relocation areas based upon best suitable habitat available before the Permittee starts the Covered Activities.

- 8.6. Injured Covered Species. The Designated Biologist shall immediately take any individual of the Covered Species that is injured to a DFG-approved wildlife rehabilitation or veterinary facility. Permittee shall identify the facility before starting Covered Activities. Permittee shall bear any costs associated with the care or treatment of such injured Covered Species. The Designated Representative shall notify DFG of the injury to the Covered Species immediately by telephone and e-mail followed by a written incident report. Notification shall include the date, time, location and circumstances of the incident, and the name of the facility where the animal was taken.
- 8.7. Trenching and Mowing. Permittee shall, prior to trenching, mow vegetation along the fence line to the width necessary to accommodate the trenching equipment and a walking buffer to facilitate locating and avoiding burrows and California tiger salamanders that may be present within the action area. The Designated Biologist will perform clearance surveys within the area to be cleared immediately prior to mowing and will be onsite during all irrigation installation activities that could result in take, i.e., mowing, trenching, vehicular access, etc. The Designated Biologist does not have to be present on site during hand digging of holes or plant installation, but will be available by phone if a species protected by CESA is observed on site.
- 8.8. Extent of Daily Trenching. Permittee shall schedule trenching and installation of irrigation in a manner not to exceed the length that can be trenched, irrigation conduit installed, and backfilled in a single day. All trenches shall be backfilled by the end of work each day; no trenches shall be left open overnight.
- 8.9. Rodenticide and Herbicide Use. Permittee shall use rodenticides and herbicides in the Project Area in such a manner to prevent primary or secondary poisoning of Covered Species, and the depletion of prey populations on which they depend. All uses of such compounds shall observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Pesticide Regulation, and other appropriate State and federal regulations.
- 8.10. Rain Events. Permittee shall not perform Covered Activities within 24 hours following rain events.
- 8.11. Excavation of Burrows. Permittee shall perform excavation of ground squirrel and rodent burrows, under the supervision of the Designated Biologist, to salvage Covered Species with hand tools whenever possible. The depth to which Covered Species are found depends on the burrow-specific conditions. Excavation should extend into the moist areas of the burrows that can sustain the Covered Species through the dry summer months. The depth at which these animals are found

should be recorded whenever possible and the information should be provided to DFG.

8.12. Capture and Relocation. If any person discovers a Covered Species in the Project Area, the Designated Biologist shall capture it and place the individual Covered Species in a clear plastic container of suitable size (e.g., enough room so the animal is not unnecessarily inhibited in its movements). The container should be kept moist with damp paper towels, 1/4-inch or 1/2-inch soft foam rubber, or soap-free natural or synthetic sponges. The lids of the containers shall have small air holes for ventilation. If possible, the Designated Biologist shall place only one animal in each plastic container. More than one animal can be placed in a shoe box-sized or larger container; however, animals of significantly different sizes or life history stages shall not be mixed in order to avoid injury or depredation. The Designated Biologist shall ensure that individuals are never so crowded that they are touching one another. Individual plastic containers containing Covered Species shall be held in an ice chest. Ice packs may be placed on top of the containers to maintain a cool temperature comparable to a refrigerator. The ice chests shall be kept in a cool, dark, quiet, secure place. The Designated Biologist shall release the Covered Species as soon as possible. The Designated Biologist shall release Covered Species at the mouth of a ground squirrel or other rodent burrow of suitable size. If burrow density allows, only one animal shall be released per burrow. A maximum of three individual Covered Species may be placed in extensive burrows. The ground squirrel burrows or other rodent burrows must be currently used by the appropriate rodent species and the burrows must have moist and cool conditions to support salamanders. Covered species may be encouraged to enter the burrows by gently nudging if they do not enter on their own. Individual Covered Species shall be released one at a time rather than en masse.

9. Habitat Management Land Acquisition and Restoration

DFG has determined that permanent protection and perpetual management of compensatory habitat is necessary and required pursuant to CESA to fully mitigate Project-related impacts of the taking on the Covered Species that will result with implementation of the Covered Activities. This determination is based on factors including an assessment of the importance of the habitat in the Project Area, the extent to which the Covered Activities will impact the habitat, and DFG's estimate of the acreage required to provide for adequate compensation.

To meet this requirement, the Permittee shall either purchase 13 acres of Covered Species credits from a DFG-approved mitigation or conservation bank with a service area that includes the Project Area OR shall provide for the permanent protection and management of 13 acres of Habitat Management (HM) lands as described below in Condition 9.3, and

calculation and deposit of the management funds (Condition 9.4). Permanent protection and perpetual management of compensatory habitat must be complete before starting Covered Activities, or within 18 months of the effective date of this ITP if Security is provided pursuant to Condition 10 below.

9.1. Cost Estimates. DFG has estimated the cost of perpetual management of the HM lands as follows:

9.1.1. Land acquisition costs for HM lands identified in Condition 9.3 below, estimated at \$12,000/acre for 13 acres: \$156,000. Land acquisitions costs are estimated using local fair market current value for lands with habitat values meeting mitigation requirements;

9.1.2. Start-up costs for HM lands, including initial site protection and enhancement costs as described in Condition 9.3.5 below, estimated at \$50,000.

9.1.3. Interim management period funding as described in Condition 9.3.6 below, estimated at \$25,000;

9.1.4. Long-term management funding as described in Condition 9.4 below, estimated at \$5,000/acre for 13 acres: \$65,000.00. The long-term management endowment fund is estimated initially for the purpose of providing Security to ensure implementation of HM land management.

9.1.5. Related transaction fees including but not limited to account set-up fees, administrative fees, title and documentation review and related title transactions, expenses incurred from other state agency reviews, and overhead related to transfer of HM Lands to DFG as described in Condition 9.5, estimated at \$6,000.00.

9.2. Covered Species Credits. Prior to initiating Covered Activities, or no later than 18 months from the issuance of this ITP if Security is provided pursuant to Condition 10 below, the Permittee shall purchase 13 acres of Covered Species credits from a DFG-approved mitigation or conservation bank with a service area that includes the Project Area.

OR:

9.3. Habitat Acquisition and Protection. Prior to initiating Covered Activities, or no later than 18 months from the issuance of this ITP if Security is provided pursuant to Condition 10 below, to provide for the protection of the HM lands, the Permittee shall:

- 9.3.1. Fee Title/Conservation Easement. Transfer fee title to the HM lands to DFG pursuant to terms approved by DFG. Alternatively, a DFG-approved non-profit organization qualified pursuant to California Government Code section 65965 or DFG-approved public agency (collectively “approved entity”) may hold fee title or act as grantee for a conservation easement over the HM lands. If an approved entity holds fee title, Permittee shall ensure a conservation easement is recorded in favor of DFG or a DFG-approved entity as grantee. If an approved entity holds a conservation easement, DFG shall be named third-party beneficiary. The Permittee shall obtain DFG approval of any conservation easement before its recordation;
- 9.3.2. HM Lands Approval. Obtain DFG approval of the HM lands before acquisition and/or transfer of the land by submitting, at least three months before acquisition and/or transfer of the HM lands, a formal Proposed Lands for Acquisition Form (see Attachment 2B) identifying the land to be purchased or property interest conveyed to an approved entity as mitigation for the Project’s impacts on Covered Species;
- 9.3.3. HM Lands Documentation. Provide a recent preliminary title report, initial hazardous materials survey report, and other necessary documents (see Attachment 2A). All documents conveying the HM lands and all conditions of title are subject to the approval of DFG, and if applicable, the Wildlife Conservation Board and the Department of General Services;
- 9.3.4. Land Manager. Designate an interim and long-term land manager. Permittee may select the conservation easement grantee, land owner, or other party as the land manager. Documents related to land management shall identify the land manager. Permittee shall notify DFG of any subsequent changes in the land manager within 30 days of the change. If DFG will hold fee title to the mitigation land, DFG will also act as long-term land manager unless otherwise specified.
- 9.3.5. Start-up Activities. Provide for the implementation of start-up activities, including the initial site protection and enhancement of HM lands, once the HM lands have been approved by DFG. Start-up activities include, at a minimum: (1) preparing a final management plan for DFG approval (see <http://www.dfg.ca.gov/habcon/conplan/mitbank/>); (2) conducting a baseline biological assessment and land survey report within 4 months of recording or transfer; (3) developing and transferring Geographic Information Systems (GIS) data if applicable; (4) establishing initial fencing; (5) conducting litter removal; and (6) conducting initial habitat restoration or enhancement.

9.3.6. Interim Management (Initial and Capital). Provide for the interim management of the HM lands. The interim management period shall be a minimum of 3 years from the date of HM land acquisition and protection and full funding of the Endowment and includes expected annual management (described in the Sweet Ranch Conservation Practices Management Plan) following start-up activities. Interim management period activities include fence repair, continuing trash removal, site monitoring, and vegetation management. Permittee shall either

(1) provide a security to DFG for the 3-year interim management amount that the

landowner, Permittee, or land manager agrees to manage at their own expense, (2) establish an escrow account with instructions to pay the land manager annually in advance, (3) establish a short-term enhancement sub-account with the National Fish and Wildlife Foundation (NFWF) for annual payment to the land manager, or (4) establish a short-term enhancement account with DFG for annual payment to the land manager.

9.4. Endowment Fund. If the Permittee will permanently protect and perpetually manage compensatory habitat as described in Condition 9.3, after obtaining DFG approval of the HM lands, Permittee shall provide long-term management funding for the in-perpetuity management of the HM lands by establishing a long-term management fund (Endowment Fund). The Endowment Fund is a sum of money, held in a DFG-authorized trust fund that provides funds for the perpetual management, maintenance, monitoring, and other activities on the HM lands consistent with the Sweet Ranch Conservation Practices Management Plan. Endowment Fund as used in this ITP shall refer to the endowment deposit and all interest, dividends, other earnings, additions and appreciation thereon.

9.4.1. Identify an Endowment Fund Manager. The Endowment Fund shall be held by NFWF or DFG;

9.4.2. Calculate the Endowment Funds Deposit. After obtaining DFG approval of the HM lands, long-term management plan, and Endowment Fund Manager, Permittee shall prepare a Property Analysis Record to calculate the amount of funding necessary to ensure the long-term management of the HM lands (Endowment Deposit Amount). The Permittee shall submit to DFG for review and approval the results of the PAR before transferring funds to the Endowment Fund Manager.

9.4.2.1. Capitalization Rate and Fees. Permittee shall obtain the capitalization rate from the selected Endowment Fund Manager for use in calculating

the PAR and adjust for any additional administrative, periodic, or annual fees.

9.4.2.2. Endowment Buffers/Assumptions. Permittee shall include in PAR assumptions the following buffers for endowment establishment and use that will substantially ensure long-term viability and security of the Endowment Fund:

9.4.2.2.1. 10 Percent Contingency. A 10 percent contingency shall be added to each endowment calculation to hedge against underestimation of the fund, unanticipated expenditures, inflation, or catastrophic events.

9.4.2.2.2. Three Years Delayed Spending. The endowment shall be established assuming spending will not occur for the first three years after full funding.

9.4.2.2.3. Non-annualized Expenses. For all large capital expenses to occur periodically but not annually such as fence replacement or well replacement, payments shall be withheld from the annual disbursement until the year of anticipated need or upon request to Endowment Fund Manager and DFG.

9.4.3. Transfer Long-term Endowment Funds. Permittee shall transfer the long-term endowment funds to the Endowment Fund Manager upon DFG approval of the Endowment Deposit Amount identified above. The approved Endowment Fund Manager may pool the Endowment Fund with other endowments for the operation, management, and protection of HM lands for local populations of the Covered Species but shall maintain separate accounting for each Endowment Fund.

9.5. Reimburse DFG. Permittee shall reimburse DFG for all reasonable expenses incurred by DFG such as transaction fees, account set-up fees, administrative fees, title and documentation review and related title transactions, expenses incurred from other state agency reviews, and overhead related to transfer of HM Lands to DFG.

10. Performance Security

The Permittee may proceed with Covered Activities only after the Permittee has ensured funding (Security) to complete any activity required by Condition 9 that has not been completed before Covered Activities begin. Permittee shall provide Security as follows:

- 10.1. Security Amount. The Security shall be in the amount of \$302,000.00. This amount is based on the cost estimates identified in Condition 9.1 above;
- 10.2. Security Form. The Security shall be in the form of an funding assurance letter signed by the Deputy District Directors of Environmental Planning and Engineering and Project Management, or another form of Security approved in advance in writing by DFG's Office of the General Counsel or another mechanism approved in advance in writing by DFG's Office of the General Counsel;
- 10.3. Security Timeline. The Security shall be provided to DFG before Covered Activities begin or within 30 days after the effective date of this ITP, whichever occurs first.

Even if Security is provided, the Permittee must complete the required acquisition, protection and transfer of all HM lands and record any required conservation easements, or purchase the Covered Species credits from a DFG-approved mitigation or conservation bank no later than 18 months from the effective date of this ITP. DFG may require the Permittee to provide additional HM lands and/or additional funding to ensure the impacts of the taking are minimized and fully mitigated, as required by law, if the Permittee does not complete these requirements within the specified timeframe.

Amendment:

This ITP may be amended as provided by California Code of Regulations, Title 14, section 783.6, subdivision (c), and other applicable regulations and law. This ITP may also be amended without the concurrence of the Permittee as required by law, including if DFG determines that continued implementation of the Project under existing ITP conditions would jeopardize the continued existence of the Covered Species or that Project changes or changed biological conditions necessitate an ITP amendment to ensure that impacts to the Covered Species are minimized and fully mitigated.

Stop-Work Order:

DFG may issue Permittee a written stop-work order to suspend any activity covered by this ITP for an initial period of up to 25 days to prevent or remedy a violation of any ITP condition(s) (including but not limited to failure to comply with reporting, monitoring, or habitat acquisition obligations) or to prevent the illegal take of an endangered, threatened, or candidate species. Permittee shall comply with the stop-work order immediately upon receipt thereof. DFG may extend a stop-work order under this provision for a period not to exceed 25 additional days, upon written notice to the Permittee. DFG may commence the formal suspension process pursuant to California Code of Regulations, Title 14, section 783.7 within five working days of issuing a stop-work order. Neither the Designated Biologist nor DFG shall be liable for any costs incurred in complying with stop-work orders.

Compliance with Other Laws:

This ITP contains DFG's requirements for the Project pursuant to CESA. This ITP does not necessarily create an entitlement to proceed with the Project. Permittee is responsible for complying with all other applicable State, federal, and local laws.

Notices:

The Permittee shall deliver a fully executed duplicate original ITP by registered first class mail or overnight delivery to the following address:

Habitat Conservation Planning Branch
California Department of Fish and Game
Attention: CESA Permitting Program
1416 Ninth Street, Suite 1260
Sacramento, California 95814

Written notices, reports and other communications relating to this ITP shall be delivered to DFG by registered first class mail at the following addresses, or at addresses DFG may subsequently provide the Permittee. Notices, reports, and other communications shall reference the Project name, Permittee, and ITP Number 2081-2010-029-03 in a cover letter and on any other associated documents.

Original cover with attachment(s) to:

Carl Wilcox, Regional Manager
7329 Silverado Trail
Napa, California 94558
Telephone (707) 944-5517
Fax (707) 944-5563

Copy of cover without attachment(s) to:

Office of the General Counsel
California Department of Fish and Game
1416 Ninth Street, 12th Floor
Sacramento, California 95814

And:

Habitat Conservation Planning Branch
California Department of Fish and Game
1416 Ninth Street, Suite 1260
Sacramento, California 95814

Unless Permittee is notified otherwise, DFG's Regional Representative for purposes of addressing issues that arise during implementation of this ITP is:

Incidental Take Permit
No. 2081-2010-029-03
CALIFORNIA DEPARTMENT OF TRANSPORTATION
SWEET RANCH MITIGATION PROJECT

Marcia Grefsrud
7329 Silverado Trail
Napa, California 94558
Telephone (707) 644-2812

Compliance with CEQA:

DFG's issuance of this ITP is subject to CEQA. DFG is a responsible agency pursuant to CEQA with respect to this ITP because of prior environmental review of the Project by the lead agency, California Department of Transportation. (See generally Pub. Resources Code, §§ 21067, 21069.) The lead agency's prior environmental review of the Project is set forth in the State Route 84 Realignment and Widening Initial Study/Environmental Assessment (State Clearinghouse #2004062018) that the California Department of Transportation certified on April 27, 2005. At the time the lead agency certified the Negative Declaration and approved the Project it also adopted all mitigation measures described in the Negative Declaration as conditions of Project approval.

In fulfilling its obligations as a responsible agency, DFG's obligations pursuant to CEQA are more limited than those of the lead agency. DFG, in particular, is responsible for considering only the effects of those Project activities that it is required by law to carry out or approve, and mitigating or avoiding only the direct or indirect environmental effects of those parts of the Project that it decides to carry out, finance, or approve (Pub. Resources Code, § 21002.1, subd. (d); CEQA Guidelines, §§ 15041, subd. (b), 15096, subds. (f)-(g)).⁵ Accordingly, because DFG's exercise of discretion is limited to issuance of this ITP, DFG is responsible for considering only the environmental effects that fall within its permitting authority pursuant to CESA.

This ITP, along with DFG's CEQA findings for this ITP and Project, which are available as a separate document, provide evidence of DFG's consideration of the lead agency's Negative Declaration for the Project and the environmental effects related to issuance of this ITP (CEQA Guidelines, § 15096, subd. (f)). DFG finds that issuance of this ITP will not result in any previously undisclosed potentially significant effects on the environment or a substantial increase in the severity of any potentially significant environmental effects previously disclosed by the lead agency. Furthermore, to the extent the potential for such effects exists, DFG finds adherence to and implementation of the Conditions of Project Approval adopted by the lead agency, as well as adherence to and implementation of the Conditions of Approval imposed by DFG through the issuance of this ITP, will avoid or reduce to below a level of significance any such potential effects. DFG consequently finds that issuance of this ITP will not result in any significant, adverse impacts on the environment.

⁵ The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

Findings Pursuant to CESA:

These findings are intended to document DFG's compliance with the specific findings requirements set forth in CESA and related regulations. (Fish & G. Code § 2081, subs. (b)-(c); Cal. Code Regs., tit. 14, §§ 783.4, subds, (a)-(b), 783.5, subd. (c)(2).)

DFG finds that issuance of this ITP complies and is consistent with the criteria governing the issuance of ITPs pursuant to CESA:

- (1) Take of Covered Species as defined in this ITP will be incidental to the otherwise lawful activities covered under this ITP;
- (2) Impacts of the taking on Covered Species will be minimized and fully mitigated through the implementation of measures required by this ITP and as described in the MMRP. Measures include: (1) permanent habitat protection; (2) establishment of avoidance zones; (3) worker education; and (4) Quarterly Compliance Reports. DFG evaluated factors including an assessment of the importance of the habitat in the Project Area, the extent to which the Covered Activities will impact the habitat, and DFG's estimate of the acreage required to provide for adequate compensation. Based on this evaluation, DFG determined that the minimization, monitoring, reporting, and funding requirements of this ITP minimizes and fully mitigates the impacts of the taking caused by the Project;
- (3) The take avoidance and mitigation measures required pursuant to the conditions of this ITP and its attachments are roughly proportional in extent to the impacts of the taking authorized by this ITP;
- (4) The measures required by this ITP maintain Permittee's objectives to the greatest extent possible;
- (5) All required measures are capable of successful implementation;
- (6) This ITP is consistent with any regulations adopted pursuant to Fish and Game Code sections 2112 and 2114;
- (7) Permittee has ensured adequate funding to implement the measures required by this ITP as well as for monitoring compliance with, and the effectiveness of, those measures for the Project; and
- (8) Issuance of this ITP will not jeopardize the continued existence of the Covered Species based on the best scientific and other information reasonably available, and this finding includes consideration of the species' capability to survive and reproduce, and any adverse impacts of the taking on those abilities in light of (1) known

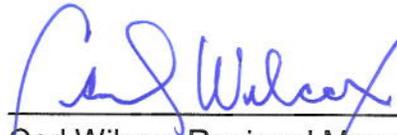
population trends; (2) known threats to the species; and (3) reasonably foreseeable impacts on the species from other related projects and activities. Moreover, DFG's finding is based, in part, on DFG's express authority to amend the terms and conditions of this ITP without concurrence of the Permittee as necessary to avoid jeopardy and as required by law.

Attachments:

ATTACHMENT 1	Mitigation Monitoring and Reporting Program
ATTACHMENT 2A, 2B	Habitat Management Lands Checklist; Proposed Lands for Acquisition Form

ISSUED BY THE CALIFORNIA DEPARTMENT OF FISH AND GAME

on March 14, 2011.



Carl Wilcox, Regional Manager
BAY DELTA REGION

ACKNOWLEDGMENT

The undersigned: (1) warrants that he or she is acting as a duly authorized representative of the Permittee, (2) acknowledges receipt of this ITP, and (3) agrees on behalf of the Permittee to comply with all terms and conditions of this ITP.

By: James B. Richards Date: 03/30/11

Printed Name: JAMES B. RICHARDS Title: DDD, ENVIRONMENTAL PLANNING & ENG.

Incidental Take Permit
No. 2081-2010-029-03
CALIFORNIA DEPARTMENT OF TRANSPORTATION
SWEET RANCH MITIGATION PROJECT