# APPENDIX C

## Biological Documentation:

Draft Biological Assessment for NMFS

# Fresno Canyon Flood Mitigation

Ventura County Watershed Protection District

PDMC-PJ-09-CA-2007-013

*June 2009*

FEMA

**Federal Emergency Management Agency**
**Department of Homeland Security**
1111 Broadway, Suite 1200
Oakland, California 94607

This document was prepared by

URS Group, Inc.
1333 Broadway, Suite 800
Oakland, CA 94612

Contract No. HSFEHQ-06-D-0162
Task Order No. HSFEHQ-06-J-048

15300276.00100

**FEMA Reviewers, please NOTE:**

**The attached document is a <u>Final Draft</u>:** This document is ready for final FEMA review. Please review our responses to the comments received for the Draft report to make sure our responses are acceptable. We anticipate minor comments and changes, if any.

# Table of Contents

## Tables



## Figures



## Appendices

| | |
|---|---|
| °F | degrees Fahrenheit |
| AMSL | above mean sea level |
| CalFish | California Cooperative Anadromous Fish and Habitat Data Program |
| CDFG | California Department of Fish and Game |
| C.F.R. | Code of Federal Regulations |
| cfs | cubic foot (feet) per second |
| CNPS | California Native Plant Society |
| DPS | Distinct Population Segment |
| ESA | Endangered Species Act |
| FEMA | Federal Emergency Management Agency |
| ft/s | foot (feet) per second |
| NMFS | National Marine Fisheries Service |
| MSHCP | Multiple Species Habitat Conservation Plan |
| PDM | Pre-disaster Mitigation |
| SR | State Route |
| URS | URS Group, Inc. |
| USFWS | U.S. Fish and Wildlife Service |
| U.S.C. | United States Code |
| VCWPD | Ventura County Watershed Protection District |

# SECTION ONE INTRODUCTION

The Department of Homeland Security's Federal Emergency Management Agency (FEMA) proposes to provide Pre-disaster Mitigation (PDM) Program federal financial assistance (federal action) (PDM-PJ-09-CA-2007-013) to the Ventura County Watershed Protection District (VCWPD) (Subgrantee), through the California Emergency Management Agency (f/k/a Governor's Office of Emergency Services), in support of the Fresno Canyon Flood Mitigation Project (proposed project). The Subgrantee's proposed project to construct a flood-control facility to transport flood water, sediment, and debris from Fresno Canyon to the Ventura River is intended to reduce the risk of flooding in the community of Casitas Springs in Ventura County, California, and on State Route (SR) 33.

The PDM Program assists States and communities by providing Federal financial assistance to implement sustained, pre-disaster, natural-hazard mitigation programs to reduce the risk of injury and damage from natural disasters and also to reduce reliance on funding from disaster declarations.

This report contains the results of a Biological Assessment that FEMA has prepared to evaluate the potential effects of the federal action and the Subgrantee's proposal on species that are listed or proposed for listing under the Endangered Species Act of 1973 (ESA) (16 U.S.C. §§ 1531-1544 [2007]) and that are under the jurisdiction of the National Marine Fisheries Service (NMFS). The potential effects on federally listed species have been evaluated in accordance with Section 7 of the ESA (16 U.S.C. § 1536). Measures to avoid and/or minimize take or disturbance to potentially affected species are included in the report.

FEMA is also consulting separately with the U.S. Fish and Wildlife Service (USFWS) regarding the potential adverse effects to species that are listed and proposed to be listed under the ESA and that are under USFWS jurisdiction.

The remainder of this report is organized as follows:

- Section 2: Purpose and need for the federal action
- Section 3: Description of the project area and Subgrantee's proposed project
- Section 4: Description of the affected environment including habitats and the listed or proposed species that are relevant to the proposed project
- Section 5: Potential effects from the proposed project on the southern California steelhead (*Oncorhynchus mykiss*) Distinct Population Segment (DPS) and measures to avoid and/or minimize potential adverse effects on the species
- Section 6: References cited in the report
- Section 7: List of report preparers

# SECTION TWO PURPOSE AND NEED

The existing flood-control channel in Casitas Springs is inadequate for the proper transport of water and debris associated with flood events. Storm water and debris flows from Fresno Canyon flooded the community of Casitas Springs in Ventura County, California, three times between 1995 and 2005, damaging dozens of homes and requiring the closure of SR 33 for up to 2 days during each flood event. An average of more than 50,000 vehicles travel on SR 33 in the Casitas Springs area every day (Caltrans 2007). Residential areas on both sides of Fresno Canyon are subject to flooding at an estimated frequency of once every 10 years. In addition, the flood-control channel clogs and overflows frequently, and water from the Ventura River frequently flows up the channel, creating a "backwater effect" that floods property adjacent to the channel (VCWPD 2007).

Future storm events in the Casitas Springs area are likely to result in more flooding. The cost of repairing the damage from 100- or 50-year flood events to residences and other property in Casitas Springs is projected to exceed $2 million. Less intense flood events, if accompanied by a large amount of debris, could also cause flood damage in Casitas Springs and require the closure of SR 33.

The VCWPD has determined that their proposed project is needed to reduce the risk of flood hazards in Casitas Springs and on SR 33.

# SECTION THREE PROJECT AREA AND PROPOSED PROJECT

The following two subsections describe the general location of the project area and the details of the proposed project.

## 3.1 PROJECT AREA

The project area is approximately 5 miles inland from the Pacific Ocean in the community of Casitas Springs in Ventura County, California, immediately north (upstream) of Foster Park (Figure 1) and on the eastern bank of the Ventura River south of the existing flood-control channel (Figure 2). The project area encompasses a small section of the Ventura River bank and the associated uplands, extending approximately 1,400 feet east of the Ventura River. The uplands include some riparian areas, residential areas, and a crossing of SR 33.

## 3.2 PROPOSED PROJECT

Under the proposed project, VCWPD would construct a flood-control facility to transport flood water, sediment, and debris from Fresno Canyon to the Ventura River (Figure 2). The facility would consist primarily of an extended box culvert and an open rectangular channel (known as a bypass route). The extended box culvert would begin with an inlet in Fresno Canyon approximately 300 feet east of SR 33 and run west under SR 33 to Edison Drive, and a rectangular concrete channel would extend from this point to the Ventura River. The entire length of the facility would be approximately 1,400 feet and would consist of an entrance structure approximately 300 feet long, a box culvert approximately 600 feet long, a rectangular channel approximately 300 feet long, and an outlet structure approximately 200 feet long. The facility would be designed to convey fully bulked flows resulting from a 100-year flood event.

At the bottom of Fresno Canyon, an entrance structure to the facility would be constructed with a tapered riprap inlet chute. An emergency spillway would be incorporated into the entrance structure to provide a secondary flow path into the existing flood-control channel. The entrance structure would connect to the box culvert, the beginning of which would be 12 feet wide × 10 feet deep × 150 feet long. The remaining portion of the box culvert would be 12 feet wide × 7 feet deep × 475 feet long.

The box culvert would connect to the 12-foot-wide rectangular channel and would continue for 300 feet to an outlet directing flows into the Ventura River. The channel would discharge into Ventura River just west of the Ojai Valley Trail. The vertical walls of the channel would be 8 feet high to the north and 7 feet high to the south. Because the facility would be constructed to cross below the Ojai Valley Trail, a 25-foot-long box culvert would be constructed below the trail. Regrading of the trail and installation of a bridge 12 feet long × 21 feet wide above the culvert would be required. The box culvert would connect to a 50-foot-long concrete outlet structure. The outlet structure would be followed by a concreted trapezoidal riprap outlet apron 25 feet long × 90 feet wide at its bottom. The ground immediately west of the outlet apron would

be bladed or graded for approximately 100 feet to facilitate flows from the facility into the Ventura River.

The facility would include two maintenance roads. One maintenance road would be approximately 500 feet long and immediately north of the open rectangular channel. An additional 100 feet of the maintenance road would be constructed on top of the culvert and then run north where it would terminate in an access ramp approximately 100 feet long with a 10 percent grade. The maintenance road would be 15 feet wide for most of its length and would include a vehicle turn-around area at its western end. A private access road would be incorporated into the maintenance road for use by a neighboring property owner. A fence would be built around the access road to prevent public access to the facility. The second maintenance road would be constructed at the eastern end of the facility and immediately north of the entrance structure. It would be approximately 400 feet long and connect to an existing access road for other facilities in the area.

To prevent the backwater effect from the Ventura River in the existing flood-control channel, a flapgate would be constructed at the outlet of the flood-control channel that would prevent river water from traveling up the channel (Figure 3). Because the flood-control channel serves as a wildlife corridor from the Ventura River to Fresno Canyon, a pathway around the flapgate would be constructed to allow wildlife to enter the channel.

To minimize ponding created by the current configuration of a drain near the project area (the Parkview Drain), the drain would be re-routed to connect to the box culvert portion of the new facility just east of SR 33.

Gas, water, electricity, sewer, and drainage conduits that cross the project area would be relocated or avoided as part of the proposed project. A 20-inch-diameter high-pressure gas line runs parallel to and east of SR 33 where it crosses Fresno Canyon. The box culvert would pass under this conduit with approximately 6 feet of clearance. Smaller gas lines also run in the SR 33 right-of-way and would be relocated. The water lines that exist in the area would be avoided or relocated. The most costly utility relocation would involve approximately 300 linear feet of 21-inch trunk sewer operated by the Ojai Valley Sanitary District. This sewer line would be relocated and the materials upgraded to ensure future access and reduce the risk of maintenance problems.

### 3.2.1 Construction

Construction of the facility would require a substantial amount of earthwork. The majority of earthwork would likely be completed using open trenching. Trenching would require digging trenches of up to 70 feet wide, 30 feet deep, and 400 feet long and would require 14,400 cubic yards of excavation and 14,900 cubic yards of backfill. Because excavated material would be used as fill, only 500 cubic yards of soil would be expected to be imported. Excavation would be reduced if shoring were used. Construction of the facility would require two staging areas, each

measuring 900 square feet. Both staging areas would be located in previously disturbed areas, one near the western end of the facility and the other near the eastern end (Figure 3).

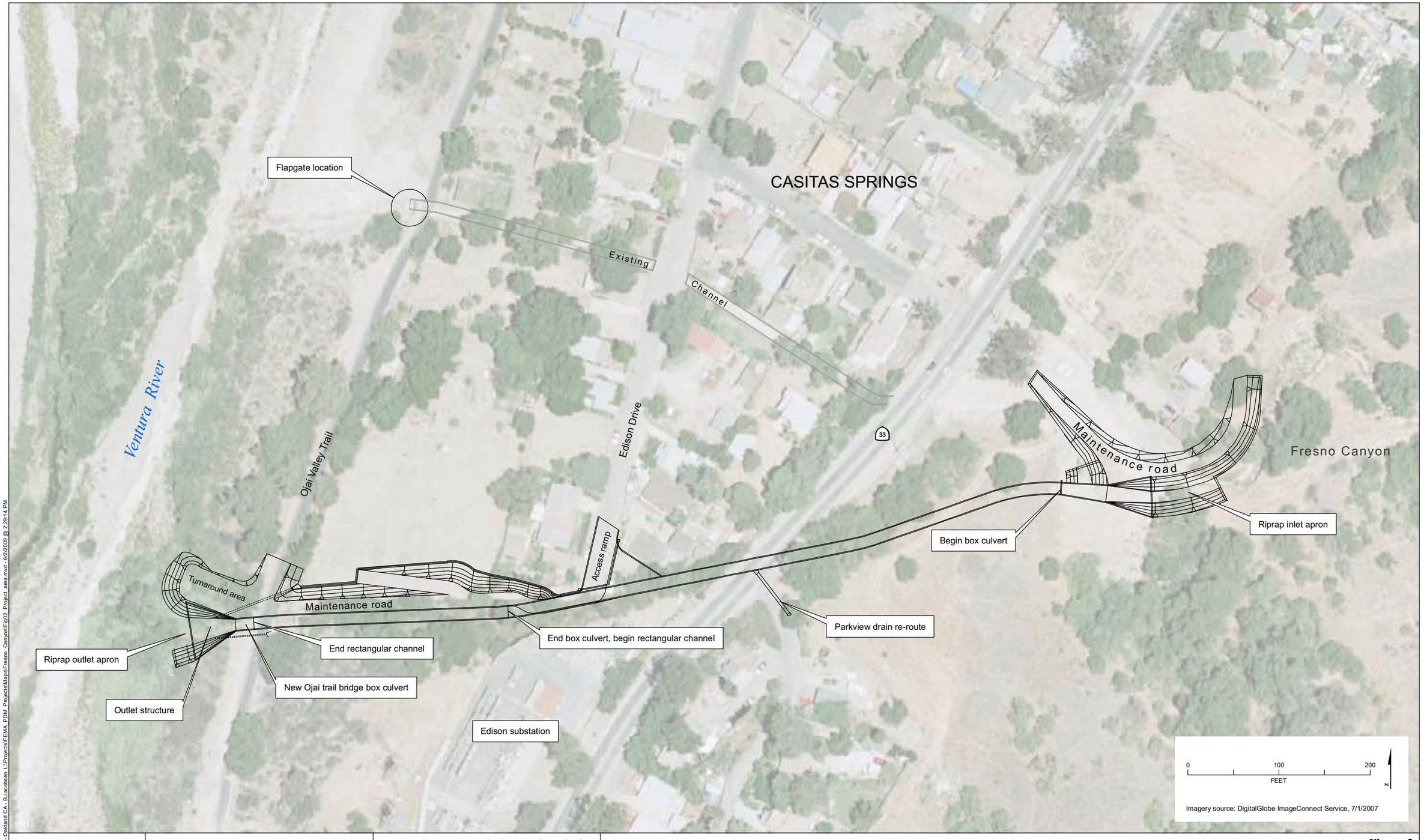
Initial construction of the rectangular open channel and inlet structure would require water diversion structures. Work on or near SR 33 would require traffic control and the construction of a temporary detour. The construction of the box culvert east of SR 33 would require excavation on a hillside, requiring extensive shoring (Figure 3) and revegetation after construction. Excavation through the hillside would require a trench up to 30 feet deep for approximately 300 feet. Construction of the box culvert would also require protection of and excavation under the gas line, as described in Section 3.2.

### 3.2.2 Maintenance

The open rectangular portion of the channel would require regular monitoring and debris removal as needed. If sediment removal were necessary, access from the upstream opening would be possible. The inlet and outlet structures would need special attention because they would be constructed to pass the entire debris and sediment load but keep large objects, especially woody debris, out. Abrasion of the box culvert and open channel would occur over time, requiring periodic repaving or coating with abrasion-resistant materials.


URS Corp - Oakland CA - B.Jacobsen L:\Projects\FEMA_PDM_Projects\Maps\Fresno_Canyon\Fig01_Project_vicinity.mxd - 6/1/2009 @ 4:37:27 PM

| | | | |
|---|---|---|---|
| FEMA | PDMC-PJ-09-CA-2007-013 | Ventura County Watershed Protection District<br>Fresno Canyon Flood Mitigation | **Figure 1**<br>Project vicinity |




URS Corp - Oakland CA - BJacobsen L:\Projects\FEMA_PDM_Projects\Maps\Fresno_Canyon\Fig02_Project_area.mxd - 6/2/2009 @ 2:29:14 PM

| | | | |
|---|---|---|---|
| FEMA | PDMC-PJ-09-CA-2007-013 | Ventura County Watershed Protection District<br>Fresno Canyon Flood Mitigation | **Figure 2**<br>Project area |


URS Corp - Oakland CA - B.Jacobsen L:\Projects\FEMA_PDM_Projects\Maps\Fresno_Canyon\Fig03_Construction_area.mxd - 6/2/2009 @ 3:24:38 PM

| FEMA | PDMC-PJ-09-CA-2007-013 | Ventura County Watershed Protection District<br>Fresno Canyon Flood Mitigation | **Figure 3**<br>Staging, trenching, shoring, and sheet piling areas |
|---|---|---|---|

# SECTION FOUR ENVIRONMENTAL SETTING AND BIOTIC RESOURCES

The following subsections describe the vegetation communities in the project area, climate in the vicinity of the project area, the study methods, and life history of special-status species.

## 4.1 HABITAT DESCRIPTION OF PROJECT AREA

The project area and 100-foot buffer are surrounded by agricultural areas on the western side of the river and residential areas with ornamental trees on the eastern side as a section of the community of Casitas Springs. The surrounding hills are dominated by coastal sage scrub.

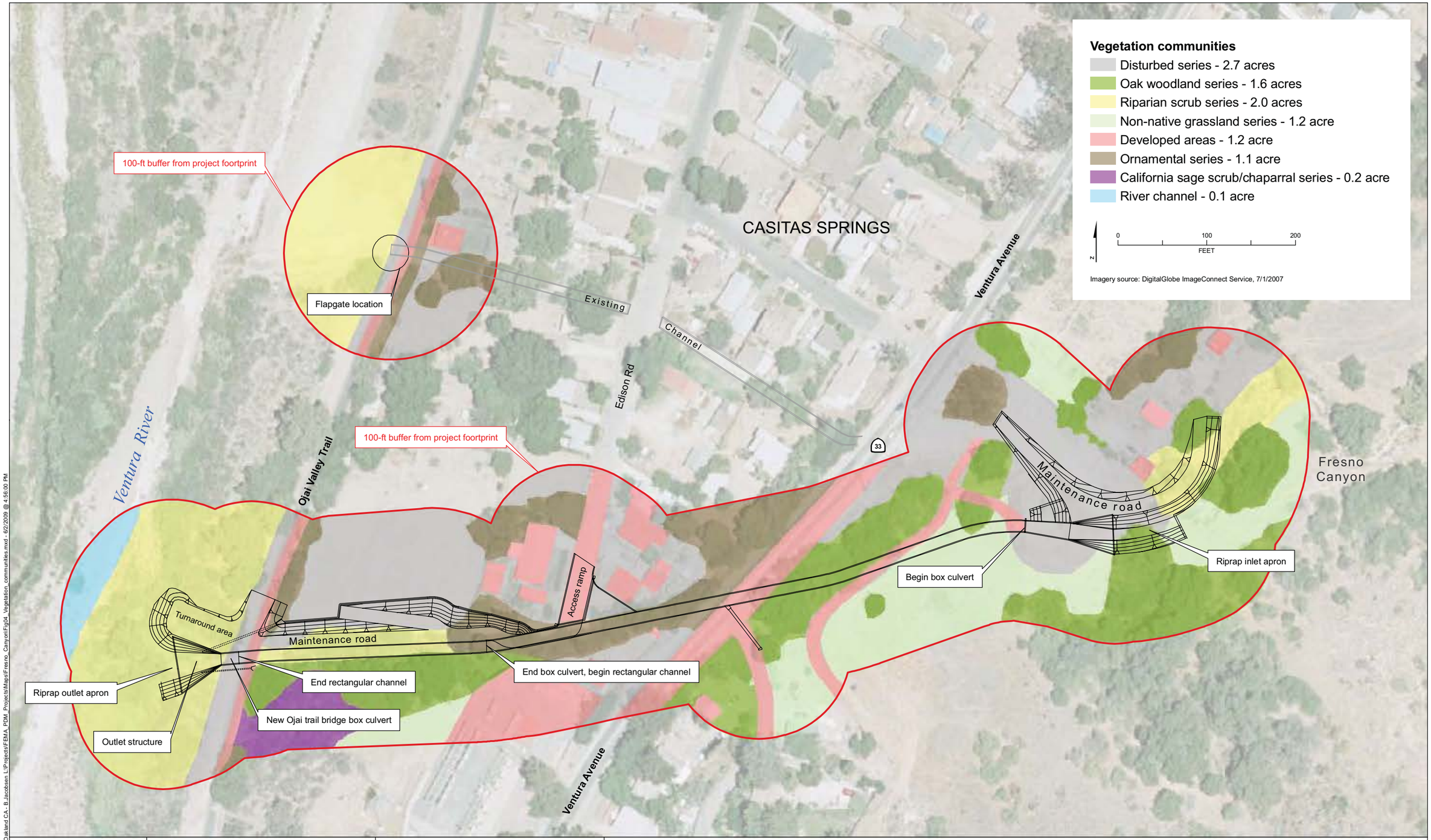
The variety of vegetation communities that exist in the project area were mapped according to *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995). Figure 4 is a vegetation map of the project area. Table 1 contains the acreages for the vegetation communities that were identified within the project area and a 100-foot buffer. Photographs that are representative of the vegetation communities within the project area and its vicinity are included in Appendix A. A list of the dominant plant species observed during the field surveys is included in Appendix B.

**Table 1. Vegetation Community Acreages in the Project Area and 100-foot Buffer**

| Vegetation Community | Project area and 100-foot Buffer |
|---|---|
| Disturbed series | 2.7 acres |
| Riparian scrub series | 2.0 acres |
| Oak woodland series | 1.6 acres |
| Non-native grassland series | 1.2 acre |
| Developed areas | 1.2 acre |
| Ornamental series | 1.1 acre |
| California sage scrub/chaparral series | 0.2 acre |
| River channel | 0.1 acre |
| Total area | 10.1 acres |

### 4.1.1 Disturbed Series

The species composition in the disturbed series reflects recent disturbance. There are no trees and few shrubs in this series. Common components include Himalayan blackberry (*Rubus discolor*), curly dock (*Rumex crispus*), bristly ox tongue (*Picris echioides*), spiny cocklebur (*Xanthium spinosum*), and western vervain (*Verbena lasiostachys*). This area also includes areas with bare ground adjacent to the Ojai Valley Trail. The project area and 100-foot buffer include approximately 2.7 acres of disturbed series.




URS Corp - Oakland CA - B.Jacobsen L:\Projects\FEMA_PDM_Projects\Maps\Fresno_Canyon\Fig04_Vegetation_communities.mxd - 6/2/2009 @ 4:56:00 PM

| | | | |
|---|---|---|---|
| FEMA | PDMC-PJ-09-CA-2007-013 | Ventura County Watershed Protection District<br>Fresno Canyon Flood Mitigation | **Figure 4**<br>Vegetation communities |

### 4.1.2 Riparian Scrub Series

Mule fat (*Baccharis salicifolia*) is the dominant shrub in the riparian scrub series and forms a dense layer. Sycamore (*Platanus racemosa*) is one of the few trees in the portion of the series east of SR 33. West of SR 33, the dominant tree is arroyo willow (*Salix lasiolepis*), which forms a dense canopy. The shrubs California sagebrush (*Artemisia californica*) and mugwort (*Artemisia douglasiana*) are scattered throughout the series. Common herbs include milk thistle (*Silybum marianum*), black mustard (*Brassica nigra*), and cheeseweed (*Malva parviflora*). In the far western portion of the series at the edge of the Ventura River, the invasive giant reed (*Arundo donax*) dominates all layers and excludes most other plants. The invasive species spiny cocklebur and tree tobacco (*Nicotiana glauca*) are also present in the series but are not common. On the eastern side of the project area, the series is represented by mule fat and sycamores only, while on the western side of the project area, the series is represented by a mixture of mule fat, willows, sycamores, and a more diverse understory. Pools of water are scattered throughout the Ventura River channel. The project area and 100-foot buffer include approximately 2.0 acres of riparian scrub series.

### 4.1.3 Oak Woodland Series

Coast live oak (*Quercus agrifolia*) is dominant in the oak woodland series as the sole overstory tree. The crowns of the coast live oaks generally form a closed canopy. The understory tree and shrub layers are typically sparse and include toyon (*Heteromeles arbutifolia*) and occasionally California bay (*Umbellularia californica*) and California walnut (*Juglans californica*). The herb layer is dominated by a variety of non-native grasses. The project area and 100-foot buffer include approximately 1.6 acres of oak woodland series.

### 4.1.4 Non-Native Grassland Series

Trees and shrubs are sparse in the non-native grassland series, which is dominated by Harding grass (*Phalaris aquatica*) and other non-native grasses. Common herbs include California poppy (*Eschscholzia californica*), fennel (*Foeniculum vulgare*), and black mustard. The project area and 100-foot buffer include approximately 1.2 acre of non-native grassland series.

### 4.1.5 Developed Areas

The developed areas correspond to existing paved roads, SR 33, the Ojai Valley Trail, private residences, and paved areas within the Edison substation. The project area and 100-foot buffer include approximately 1.2 acre of developed areas.

### 4.1.6 Ornamental Series

The ornamental series is dominated by a diverse array of ornamental trees and shrubs, primarily within a residential area. The common trees include blue gum eucalyptus (*Eucalyptus globosus*),

California walnut, Peruvian pepper tree (*Schinus molle*), sweet orange (*Citrus sinensis*), bigleaf maple (*Acer macrophyllum*), toyon, bishop pine (*Pinus muricata*), and elderberry (*Sambucus mexicana*). Common shrubs and herbs include Himalayan blackberry, English ivy (*Hedera helix*), greater periwinkle (*Vinca major*), and California manroot (*Marah fabaceus*). The project area and 100-foot buffer include approximately 1.1 acre of ornamental series.

### 4.1.7 California Sage Scrub/Chaparral Series

The California sage scrub/chaparral series is situated on a steep, rocky slope. The vegetation is dominated by a mixture of California sagebrush and black sage (*Salvia mellifera*). Bush monkeyflower (*Mimulus aurantiacus*) is a subdominant shrub. Toyon is occasionally present. Other common shrubs are coyote brush (*Baccharis pilularis*) and California buckwheat (*Eriogonum fasciculatum*). On exposed, rocky portions, occasional live-forevers (*Dudleya* sp.) are present. The series was observed on a steep slope adjacent to the Ojai Valley Trail. The project area includes approximately 0.2 acre of California sage scrub/chaparral series.

### 4.1.8 River Channel

The river channel category corresponds to the Ventura River channel, which is composed of bare ground with scattered young willows among other plant species, such as giant reed (*Arundo donax*). The river bottom is composed of sandy areas and areas with cobbles. The Ventura River channel is a wide, meandering channel (approximately 500 feet wide at the Fresno Canyon outlet), with braided, wetted channels subject to seasonal changes. The project area and 100-foot buffer include approximately 0.1 acre of river channel.

## 4.2 CLIMATE, TOPOGRAPHY, AND SOILS

The climate in the project area is Mediterranean and characterized by hot, dry summers and mild winters. As is typical for much of coastal southern California, most precipitation falls in the form of rain between the months of October and April with intervening dry summers. The average temperatures in the summer months are in the upper 80 degrees Fahrenheit (ºF) with lows in the mid 50s ºF. Average temperatures in the winter months are in the high 60s ºF with lows in the mid 30s ºF. Rainfall averages 21 inches per year with between 2 and 5 inches per month falling between November and March.

The project area is south of Ojai Valley and surrounded by three mountain ranges. To the north, the Nordhoff Ridge extents to approximately 5,000 feet above mean sea level (AMSL), this ridge continues as the Topatopa Bluff east of the Ojai Valley and stands 6,000 feet AMSL. To the north, the Sulphur Mountain bounds the Ojai Valley at slightly under 3,000 feet AMSL.

## 4.3 VENTURA RIVER MULTIPLE SPECIES HABITAT CONSERVATION PLAN

The VCWPD and seven other local agencies are cooperating agencies for the Ventura River Multiple Species Habitat Conservation Plan (MSHCP) (ENTRIX 2007), which encompasses the

Ventura River mainsteam and tributaries. The plan covers four federally listed species and their designated critical habitat if applicable: southern California steelhead, tidewater goby, California red-legged frog, and least Bell's vireo. The plan also covers operations and maintenance activities of the existing facilities that are owned and operated by the cooperating agencies, which are different from the proposed project that is described in this BA. Because the plan is intended to cover only Section 10 of the ESA (16 U.S.C. § 1539 [2007]) for the cooperating agencies, the VCWPD's proposed project described in this BA will require a Section 7 ESA consultation (16 U.S.C. § 1536[a][2], [2007]), which is not included in this MSHCP.

## 4.4 STUDY METHODS

On January 22, 2009, URS Group, Inc. (URS) biologists Lorena Solórzano-Vincent and Robin Murray, as consultants to FEMA, systematically surveyed the project area and 100-foot buffer to inventory dominant plant species observed onsite and to identify and map distinct habitat types. The plant species identified in the field are listed in Appendix B.

Sample stands of vegetation were selected as representative of specific plant communities found onsite, based on species composition and structure. Attributes of each stand were recorded using the California Native Plant Society "Vegetation Rapid Assessment Field Form" (CNPS 2007). Photographs of each unique plant community were taken during field surveys (Appendix A).

URS reviewed the sources listed below to obtain a list of species that are listed as endangered, threatened, and proposed for listing as endangered or threatened under the ESA that may occur in the project area:

- The California Department of Fish and Game (CDFG) California Natural Diversity Database records using a 10-mile radius surrounding the project area (CDFG 2009).
- A species list for Ventura County from the Ventura Field Office USFWS website (USFWS 2009).
- A review of federally listed species that may occur in the project area from the NMFS website (NMFS 2009).
- The NMFS website to identify designated critical habitat for the southern California steelhead DPS (NMFS 2005).
- A review of fish range, occurrences, and passage barrier data from the California Cooperation Anadromous Fish and Habitat Data Program (CalFish) website (CalFish 2009).

Based on the field survey and review of the above sources, FEMA determined that the southern California steelhead DPS is the only federally listed (or proposed for federal listing) species with the potential to occur in the vicinity of the project area and regulated by NMFS under the ESA. See Appendix C for more information on this species.

## 4.5 SPECIAL-STATUS SPECIES

Based on the field survey and background review and as explained in Appendix C, FEMA determined that the Ventura River provides habitat suitable to support southern California steelhead DPS, which is federally listed as endangered. Critical habitat for the southern California steelhead DPS exists in the Ventura River and adjacent riparian area in the project area.

### 4.5.1 Southern California Steelhead DPS

Steelhead (*Oncorhynchus mykiss*) have been divided into Distinct Population Segments (DPSs). The southern California steelhead DPS was listed as endangered under the ESA on August 18, 1997, and reaffirmed on January 5, 2006 (NMFS 2006). The DPS for the southern California steelhead includes all naturally spawned anadromous steelhead populations below natural and humanmade, impassable barriers in streams from the Santa Maria River, San Luis Obispo County, California (inclusive), to the U.S.-Mexico Border (NMFS 2009).

Steelhead are rainbow trout with an anadromous life history. Steelhead make spawning runs into rivers and small creeks flowing into the ocean. In general, adult steelhead return to rivers and creeks in the region from October to April. Spawning takes place in the rivers from December to April with most spawning activity occurring between January and March. Although juvenile steelhead can spend up to 7 years in freshwater before moving downstream as smolts (Busby et al. 1996), most steelhead remain in freshwater for 1 to 4 years before they out-migrate into the open ocean during spring and early summer (Goals Project 2000). Steelhead can spend up to 3 years in saltwater before returning to freshwater to spawn (Barnhardt 1986). Since juvenile steelhead remain in the creeks year-round, adequate flows, suitable water temperatures, and an abundant food supply are necessary throughout the year in order to sustain steelhead populations. The most critical period is the summer and early fall when these conditions become limiting.

Steelhead prefer main channels as opposed to small tributaries. The spawning season for steelhead extends from late December through April, although they often move up coastal streams in the fall and then hold in deep pools until the spawning period (McGinnis 1984). Migrating fish require deep holding pools (deeper than 9 feet) with cover such as underwater ledges and caverns (CDFG 1995). Coarse gravel beds in riffle areas are used for egg laying and yolk sac fry habitat once eggs have hatched.

Potential spawning areas require gravel bottoms and specific water conditions. Spawning habitat condition is strongly affected by water flow and quality, especially temperature, dissolved oxygen, and silt load, all of which can greatly affect the survival of eggs and larvae (USFWS 2004). Migratory corridors start downstream of the spawning areas and allow the upstream passage of adults and the downstream emigration of out-migrant juveniles. Migratory habitat condition is strongly affected by the presence of barriers, which can include dams, culverts, flood-control structures, unscreened or poorly screened diversions, and degraded water quality (USFWS 2004).

Both spawning areas and migratory corridors compose rearing habitat for juveniles, which feed and grow before and during their out-migration. Non-natal, intermittent tributaries also may be used for juvenile rearing. Rearing habitat condition and function may be affected by annual and seasonal flow and temperature characteristics. Specifically, the lower reaches of streams often become less suitable for juvenile rearing during the summer. Rearing habitat condition is strongly affected by habitat complexity, food supply, or presence of predators of juvenile salmonids (USFWS 2004).

Steelhead require cool, clean, well-oxygenated water and appropriate gravel for spawning. The preferred water depth of spawning ranges from about 6 to 24 inches with an optimum around 14 inches. Steelhead spawn using gravel about 0.25 to 5.0 inches in diameter. To some extent, the size of gravel that can be used depends on the size of the spawning fish. Spawning and incubation gravels should contain less than 5 percent sand and silt to ensure high permeability and oxygen content. Although steelhead prefer mostly gravel-sized material for spawning, they also use mixtures of sand and gravel, or gravel and cobble. Steelhead may spawn in intermittent streams, but juveniles move into perennial streams soon after hatching. Steelhead are generally located where water temperatures range from 50 to 59°F with an upper sustainable temperature of 68°F. Steelhead are iteroparous; that is, an individual may survive spawning, return to the ocean, and ascend streams to spawn again. However, it is unusual for steelhead to spawn more than twice, and it is usually the females that survive to spawn again.

Anadromous steelhead have two basic life histories: stream-maturing (enter freshwater with immature gonads) and ocean-maturing (enter freshwater with mature gonads). Stream-maturing steelhead, also called summer steelhead, typically enter freshwater in the spring, early summer, or possibly fall. These fish move up to the headwaters of streams, hold and mature in deep pools, and spawn in late fall and winter.

Spawning occurs in waters with velocities from 1 ft/s to 3.6 ft/s with an optimum around 2 ft/s. Larger steelhead can spawn at higher stream velocities. Spawning migrations may be hindered by water velocities of 10 to 13 feet per second (ft/s).

Juvenile steelhead hatch in 19 to 80 days depending on the water temperature. Gravel emergence occurs about 2 to 3 weeks after hatching. Fry often school and occupy quiet water along the banks of a stream. Back eddies, large woody debris, undercut banks, and undercut tree roots supply good fry habitat. Secondary channel pools with good cover are often used. As the fish grow, they occupy individual territories and move to deeper and swifter water with coarser habitat. Most juvenile steelhead occupy riffles. Some of the larger fish may occupy runs or pools, particularly in the absence of coho salmon. Fry require water 2 to 14 inches deep, with an optimum around 8 inches. Parr use water from 10 to 20 inches deep with an optimum of 10 inches. Fry and juvenile steelhead prefer a cobble/rubble sized substrate material, which is slightly larger than that preferred for spawning. Large boulder substrate is important in runs and riffles. Surface turbulence and whitewater are used for overhead cover by juvenile steelhead. Summer rearing habitat with cool water pools and extensive cover for older juvenile steelhead

are often limiting on California streams. Juvenile steelhead may migrate upstream or downstream to find suitable habitat.

Juvenile steelhead are opportunistic drift feeders. While in freshwater, steelhead subsist on aquatic invertebrates and terrestrial invertebrates that fall into the water. Larger steelhead are piscivorous (fish-eating).

### 4.5.2 Designated Critical Habitat

On September 2, 2005, NMFS designated final critical habitat for the southern California steelhead DPS, which includes the Ventura River (NMFS 2005), with an effective date of January 2, 2006. Suitable habitat for southern California steelhead DPS exists within the Ventura River channel and associated riparian habitat. The project area is within the Ventura River Hydrologic Unit (4402) identified as critical habitat for the southern California steelhead (NMFS 2005).

The primary constituent elements for the southern California steelhead designated critical habitat are (NMFS 2005):

- Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development. These features are essential to conservation because, without them, the species cannot successfully spawn and produce offspring.
- Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks. These features are essential to conservation because, without them, juveniles cannot access and use the areas needed to forage, grow, and develop behaviors (e.g., predator avoidance, competition) that help ensure their survival.
- Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival. These features are essential to conservation because, without them, juveniles cannot use the variety of habitats that allow them to avoid high flows, avoid predators, and successfully immigrate to the ocean. Similarly, these features are important for adults because they allow fish in a non-feeding condition to successfully swim upstream, avoid predators, and reach spawning areas on limited energy stores.
- Estuarine areas free of obstruction with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and

saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth, and maturation. These features are essential to conservation because, without them, juveniles cannot reach the ocean in a timely manner and use the variety of habitats that allow them to avoid predators and compete successfully in the ocean. Similarly, these features are important to adults because they provide a final source of abundant forage that will provide them the energy stores needed to make the physiological transition to fresh water, migrate upstream, avoid predators, and develop to maturity upon reaching the spawning areas.

- Nearshore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels. As in the case with freshwater migration corridors and estuarine areas, nearshore marine features are essential to conservation because, without them, juveniles cannot successfully transition from natal streams to offshore marine areas.
- Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation. These features are essential for conservation because, without them, juveniles cannot forage and grow to adulthood.

# SECTION FIVE POTENTIAL ADVERSE EFFECTS ON SPECIAL-STATUS SPECIES

The following subsections describe the potential adverse effects on steelhead and measures to avoid and/or minimize those effects.

## 5.1 POTENTIAL FOR TAKE

Because of the proximity of the project area to the Ventura River and its associated riparian zone, the proposed project has the potential to adversely affect individuals of the southern California steelhead DPS during project construction. Juvenile members of this species are likely to be present in the Ventura River within the project area year-round. The proposed project could potentially result in the take of steelhead individuals through direct injury or mortality of juvenile fish or indirectly affect individuals by temporarily degrading habitat quality during project construction. Fish may be killed or trapped by materials that accidentally fall into the water. Accidental spills of hazardous materials during project construction could injure or kill members of these species.

The proposed project includes the installation of a flapgate at the western end of the proposed flood-control channel to protect against backflow from the Ventura River. The flapgate would prevent fish from gaining access to the concrete channel connecting the Ventura River to Fresno Canyon east of SR 33. Therefore, no take would result from project operation during high floods.

As discussed in Section 5.4, avoidance and minimization measures would be in place to prevent and/or reduce the likelihood of incidental take of this species.

## 5.2 EROSION AND SEDIMENTATION

The following two subsections discuss erosion and sedimentation effects during project construction and project operation.

### 5.2.1 Project Construction

Steelhead could be indirectly affected by increased erosion and sedimentation during project construction. Water quality could be temporarily affected.

Sedimentation could result in the loss of deep, cool water pools, reducing the amount of available habitat at the proposed outlet in the Ventura River bank that juvenile and adult salmonids could use for shelter or forage. Sediment can also smother the aquatic invertebrates that juvenile salmonids feed on or cement the substrate so that spawning cannot take place.

Implementation of the avoidance and minimization measures described in Section 5.4 would help minimize any potential adverse affects to steelhead habitat.

### 5.2.2 Project Operation

During project operation, the total sediment load discharged into the Ventura River would be discountable during large storm events compared to existing conditions. Under existing conditions during large storm events, sediment sometimes settles in the concrete portion of the existing channel, decreasing its capacity to convey flow and resulting in flooding. The sediment is mechanically removed from the existing channel at Fresno Canyon Creek and disposed of. The proposed box culvert and rectangular channel are designed so that the sediment entering the culvert at the base of Fresno Canyon would be conveyed to the outlet of the channel at the Ventura River. To the extent that sediment does not settle in the new channel and does not need to be mechanically removed, there would be a minor increase in sediment discharging into the Ventura River. Only the largest debris would be trapped by a trash rack upstream of the proposed box culvert. During high flows in the Ventura River, flows may backwater into the proposed channel, and some sediment may settle out at the end of the channel just before entering the Ventura River. This sediment would be removed. Even though the total load of sediment discharged during project operation may increase slightly, there would likely be less sediment discharged to the Ventura River at the existing outlet from Fresno Canyon. After construction of the proposed project, the existing channel would be used primarily to convey local drainage because the flows from Fresno Canyon would be directed along the proposed bypass route.

The minor increase in sediment load from Fresno Canyon would only occur during storm events and would not significantly affect sediment concentrations in the Ventura River. The Ventura River conveys much larger sediment loads during large storm events compared to Fresno Canyon. The upper watershed of the river also contains steep slopes and erodible soils that contribute a large amount of sediment to the river. Even though the sediment loads have not been quantified, they are correlated with the stream flows. The peak flows in the river at Casitas Springs were determined to be 35,200 cubic feet per second (cfs), 56,600 cfs, and 66,600 cfs for the 10-year, 50-year, and 100-year floods, respectively (Tetra Tech, 2009). The peak flows in Fresno Canyon at the confluence with the Ventura River for the same recurrence intervals were respectively determined to be 830 cfs, 1,240 cfs, and 1,450 cfs (Hawks & Associates 2007). The peak flows in Fresno Canyon are less than 2.5 percent of the peak flows in the Ventura River. Even though the peak flows on both flooding sources are not likely to occur at exactly the same time, the flow from Fresno Canyon is not likely to significantly affect the flow or sediment concentration in the Ventura River. If a large storm occurred in Fresno Canyon (e.g., a large thunderstorm) when flows were small in the Ventura River, any sediment discharged to the river would quickly settle out near the mouth of the proposed Fresno Canyon bypass route. Any increases in suspended sediment concentration would only last for the duration of the storm and would not increase the concentration in Ventura River beyond the normal variability.

Given that project operation would not significantly increase suspended sediment concentrations in the Ventura River, no adverse effects on adult and juvenile steelhead are anticipated from erosion and sedimentation. Adult steelhead are known to migrate in the Ventura River during high flows typically occurring from October through April, at which time sediment loads during

large storm events are already high in the river. Most juvenile steelhead remain in freshwater for 1 to 4 years before they out-migrate into the open ocean. The resident juvenile steelhead would not be affected during the dry season because it is unlikely that Fresno Canyon would be discharging during this time of the year, and during the winter, the total sediment load discharged into the Ventura River would be discountable.

## 5.3 CRITICAL HABITAT

The part of the proposed project that would adversely affect critical habitat for this species is limited to the construction of the outlet and removal of riparian vegetation at the outlet location. The potential adverse effects associated with the removal of riparian vegetation are the removal of vegetation that provides cover and shade for aquatic species, the introduction of sediment into the waterway from erosion or runoff, and the loss of suitable gravel substrate through burial by sediment.

A minor amount of designated critical habitat for southern California steelhead (approximately 0.16 acre) would be permanently removed as a result of the proposed project. Habitat components, such as riparian vegetation, important to the conservation of these species would be affected by the proposed project. The riparian zone functions are an essential feature of critical habitat for steelhead. The removal of riparian vegetation could result in higher stream temperatures through loss of shade and increased sedimentation from the loss of natural bank stabilization. As discussed in Section 5.4, avoidance and minimization measures would be in place to prevent or reduce adverse effects to designated critical habitat.

## 5.4 AVOIDANCE AND MINIMIZATION MEASURES FOR SPECIAL-STATUS SPECIES

The VCWPD is responsible for implementing the following measures to avoid and minimize potential adverse effects to the southern California steelhead DPS and designated critical habitat.

### 5.4.1 Proposed Project Timing

To reduce the adverse effects to the southern California steelhead DPS during their migration and spawning season, the VCWPD shall perform all construction activities outside the migration period. Typically, construction activities would take place between June 15 and October 15. However, because the river may also provide habitat to support federally listed species under USFWS jurisdiction, the work window has been modified to between August 31 and October 31.

### 5.4.2 Take Avoidance Measures

VCWPD shall implement the following measures to avoid and/or minimize the potential for take of steelhead:

- Exclusion fences composed of silt fence material shall be installed at the margins of the work area to prevent workers or construction materials from encroaching into adjacent

habitat and to prevent materials from entering the waters of Ventura River. The fence shall be monitored periodically for integrity and effectiveness. The fencing shall be maintained for the duration of construction and removed upon project completion.

- An NMFS-approved biologist shall monitor construction activities that involve work within the Ventura River, dewatering activities, and installation of the outlet structure for the purpose of identifying and reconciling any condition that could adversely affect listed salmonids or their habitat.
- Preconstruction surveys shall include the collection and relocation of fish by an NMFS-approved fisheries biologist from the construction site prior to and during dewatering. The NMFS-approved fisheries biologist shall be familiar with the life history and identification of steelhead.
- All captured fish shall be held in well-oxygenated water with temperatures equivalent to ambient instream temperatures. Once recovered, they shall be placed in suitable habitat (instream cover and pools deeper than 1 foot) downstream of the project area.
- If any steelhead individuals are found dead or injured, the biologist shall immediately contact the NMFS Long Beach Field Office to review the activities that resulted in the take and determine whether additional protective measures are required.

### 5.4.3 Erosion, Sedimentation, Spill, and Pollution Control

VCWPD shall implement the following measures to prevent erosion, sedimentation, potential spills, and pollution:

- Disturbance to existing grades and vegetation shall be limited to the actual site of the project and necessary access routes. Placement of all roads, staging areas, and other facilities shall be carried out so as to avoid and limit disturbance to streambank or stream channel habitat to the extent possible.
- Erosion-control and sediment-detention devices (e.g., well-anchored sandbag cofferdams, straw bales, silt fences) shall be incorporated into the project design and implemented at the time of construction. These devices shall be in place during construction activities, and after if necessary, to minimize fine sediment and sediment/water slurry input to flowing water and to detain sediment-laden water onsite. These devices shall be placed at all locations where the likelihood of sediment input exists. Supply of erosion control materials shall be available to cover small sites that may become bare and to respond to sediment emergencies.
- The VCWPD shall inspect the performance of sediment-control devices at least once each day during construction to ensure that the devices are functioning properly. If a control measure is not functioning properly, the control measure shall be repaired immediately or replaced. Additional controls shall be installed as necessary.

- Sediment shall be removed from sediment controls once the sediment has reached one-third of the exposed height of the control. Sediment collected in these devices shall be disposed of at approved disposal sites away from the collection site.
- All disturbed soils at each site shall undergo erosion-control treatment during construction and after construction is terminated. Treatment includes temporary seeding and sterile straw mulch. Any disturbed soils on a gradient of over 30 percent shall have erosion-control blankets installed.
- Any stockpiles of soil used for fill material during construction shall be covered with a tarp or erosion-control blanket, and silt fences shall be installed appropriately to contain soils from moving into area waterways. If the local weather forecast indicates a greater than a 50-percent chance of rain, the project site shall be "rain-proofed" with erosion-control measures so that no sediment or turbidity enters the stream.
- All debris, sediment, rubbish, vegetation, or other material removed from the channel banks, channel bottom, or sediment basins shall be disposed of at an approved disposal site. All petroleum product chemicals, silt, fine soils, and any substance or material deleterious to listed species shall not be allowed to pass into, or be placed where it can pass into, the stream channel. There shall be no sidecasting of material into any waterway.
- The VCWPD shall exercise every reasonable precaution to protect the Ventura River from pollution with fuels, oils, bitumens, calcium chloride, and other harmful materials.
- Construction by-products and pollutants such as petroleum products, chemicals, fresh cement, or deleterious materials shall not be allowed to discharge into the Ventura River and shall be collected and transported to an authorized disposal area.
- A plan for the emergency clean up of any spills of fuel or other material shall be prepared and kept available onsite during construction activities.
- Equipment shall be refueled and serviced at designated construction staging areas. All construction material and fill shall be stored and contained in a designated area that is located away from channel areas to prevent transport of materials into adjacent streams. A silt fence shall be installed to collect any discharge, and adequate materials for spill cleanup shall be maintained onsite.
- Construction vehicles and equipment shall be maintained to prevent contamination of soil or water (from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease).
- Good housekeeping practices, use of safer alternative products, such as biodegradable hydraulic fluids, shall be used when feasible.
- An employee training program shall be implemented. Employees shall be trained to prevent or reduce the discharge of pollutants from construction activities to waters and of the appropriate measures to take if a spill occurs.

- In the event of a spill, work shall be stopped immediately, spill control shall be implemented, and NMFS shall be notified.

### 5.4.4 Minimization of Adverse Effects on Critical Habitat

VCWPD shall implement the following measures to steelhead critical habitat:

- Disturbance to existing grades and vegetation shall be limited to the actual site of the project and necessary access routes. When possible, existing ingress or egress points shall be used and the contours of the project area shall be returned to pre-construction condition or better.
- The VCWPD shall, to the maximum extent practicable, reduce the amount of disturbance at a site to the absolute minimum necessary to accomplish the proposed project.
- Whenever practicable, existing vegetation shall be salvaged from the footprint of the project area and stored for replanting after earthmoving activities have been completed.
- Because a discountable amount of riparian vegetation (i.e., 0.16 acre) shall be permanently lost at the outlet location during project construction, the VCWPD shall restore the project area through planting willows and other riparian species within the Ventura River's riparian zone in areas adjacent to the project area. Native willow species shall be used for revegetation efforts. The revegetation efforts shall be implemented at a 3:1 ratio followed by a 5-year monitoring period to reach an 80 percent success criterion.
- The VCWPD shall take measures to prevent the introduction of invasive weeds at the construction site. The measure shall include cleaning all equipment before bringing it onsite and using only certified weed-free erosion-control and revegetation materials.

## 5.5 SUMMARY OF POTENTIAL ADVERSE EFFECTS TO SPECIAL-STATUS SPECIES

With the implementation of the measures described in Section 5.4, the proposed project would avoid and minimize potential adverse effects on the southern California steelhead DPS. However, because juvenile steelhead may occur at the Ventura River year-round, the proposed project may affect southern California steelhead as juveniles, and they may need to be removed from the project area during project construction.

## 5.6 SUMMARY OF POTENTIAL ADVERSE EFFECTS TO CRITICAL HABITAT

A discountable amount of riparian vegetation (i.e., 0.16 acre) would be permanently lost at the outlet location because of project construction but would be replaced adjacent to the project area. Avoidance and minimization measures identified in Section 5.4 would be used to minimize adverse effects to southern California steelhead DPS designated critical habitat. Therefore, the proposed project would not adversely affect the designated critical habitat.

## 5.7 CUMULATIVE EFFECTS

Cumulative effects as defined in the ESA are the effects of future State or private activities that are reasonably certain to occur within the proposed project area (50 C.F.R. § 402.14[g][4]). Cumulative effects on the species that are federally listed or proposed for listing and addressed in this report would likely occur in association with other projects near the Ventura River that would affect the riparian or instream habitat of the river. No other future State or private projects along the Ventura River in the vicinity of the project area have been identified, as of the time this report was prepared.

Cumulative effects could be the result of the net loss of riparian habitat and/or runoff of sediments, nutrients, and pollutants into the Ventura River. Potential adverse effects on fish and/or habitat resulting from the proposed project would contribute a minor but incremental basis to cumulative effects on the southern California steelhead DPS on a regional basis.

The proposed project is not expected to have a substantial cumulative effect on the southern California steelhead DPS. The expected disturbance of riparian habitat from the proposed project would be a small area (approximately 0.16 acre), and areas adjacent to the site would be revegetated after completion of the proposed project. The hydrology of the Ventura River would not be altered as a result of the proposed project. Therefore, the proposed project would not have any long-term cumulative effects on the southern California steelhead DPS or its designated critical habitat.

# SECTION SIX REFERENCES


Barnhardt, R.A. 1986. Species Profiles: *Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (Pacific Southwest) Steelhead.* U.S. Fish and Wildlife Service Biological Report 82. (11.60), 21 pp.

Busby, P.J., T.C. Wainwright, G.J. Bryant, L.J. Lierheimer, R.S. Waples, F.W. Waknitz, and I.V. Lagomarsino. 1996. *Status Review of West Coast Steelhead From Washington, Oregon, and California*. National Oceanic and Atmospheric Administration Technical Memorandum. NMFS-NWFSC-27.

CalFish (California Cooperative Anadromous Fish and Habitat Data Program). 2009. CalFish website. Available at http://www.calfish.org/DesktopDefault.aspx. Accessed in March.

Caltrans (California Department of Transportation). 2007. Caltrans Traffic Operations Division. Annual Average Daily Traffic for California State Highway 33. Available at http://traffic-counts.dot.ca.gov/2007all/r022-33i.htm. Accessed on March 3, 2009.

CDFG (California Department of Fish and Game). 1995. *Fish Species of Special Concern in California, Second Edition*.

———. 2009. Rarefind 3, a program created by the CDFG, allowing access to the California Natural Diversity Database. March 2009 version.

CNPS (California Native Plant Society). 2007. Vegetation Rapid Assessment Field Form. Available at http://www.dfg.ca.gov/biogeodata/vegcamp/pdfs/CNPS_Rapid Assessment_FieldForm_8-23-07.pdf. Accessed in February.

ENTRIX (ENTRIX, Inc.). 2007. *Draft Ventura River Multiple Species Habitat Conservation Plan.* Prepared for Casitas Municipal Water District, City of San Buenaventura, Golden State Water Company, Meiners Oaks County Water District, Ojai Valley Sanitary District, Ventura County Parks Department, Ventura County Watershed Protection District, and Ventura River County Water District.

Goals Project. 2000. *Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish, and Wildlife.* Prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. P.R. Olofson, editor. San Francisco Bay Regional Water Quality Control Board, Oakland, CA.

Hawks & Associates. 2007. *Fresno Canyon Flood Mitigation Pre-Design Study Final Report.* Prepared for Ventura County Watershed Protection District, Ventura, CA. August.

McGinnis, S. 1984. *Freshwater Fishes of California*. Berkeley: University of California Press.

NMFS (National Marine Fisheries Service). 2005. *Endangered and Threatened Species; Designation of Critical Habitat for 7 Evolutionary Significant Units of Pacific Salmon and Steelhead in California; Final Rule*. September 2.

———. 2006. *Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead; Final Rule*. January 5.

———. 2009. *Southern California Steelhead DPS: Endangered.* Available at http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Steelhead/STSCA.cfm. Accessed in February.

Sawyer, J. O., and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. Sacramento: California Native Plant Society.

Tetra Tech. 2009. *Baseline Model Calibration and Validation Report, Ventura River Watershed Hydrology Model*. Prepared for Ventura County Watershed Protection District, Ventura, CA. February 12.

USFWS (U.S. Fish and Wildlife Service). 2004. *Formal Section 7 Consultation on the Santa Fe Partners Concord to Sacramento Pipeline Project Contra Costa, Solano, and Yolo Counties, California, Permit Number 26449S.*

———. 2009. USFWS Ventura Fish and Wildlife Office website. Available at http://www.fws.gov/ventura/index.html. Accessed in January.

Ventura County Watershed Protection District (VCWPD). 2007. Fresno Canyon Flood Mitigation Pre-Design Study Final Report. Prepared for Ventura County Watershed Protection District. Prepared by Hawks & Associates, West Coast Environmental Engineering, and Earth Systems.

# SECTION SEVEN LIST OF PREPARERS

FEMA Region IX

Alessandro Amaglio, Environmental Officer

Donna M. Meyer, Deputy Environmental Officer

URS Group, Inc.

Morgan Griffin, Senior Project Manager

David Ghosh, Task Manager

Quentin Bliss, Senior Project Biologist

Lorena Solórzano-Vincent, Senior Biologist

Robin Murray, Biologist

Jeanne Hudson, Hydrologist

Bradley Jacobson, GIS Specialist

Deb Fournier, Word Processor

# APPENDIX A:
# SITE PHOTOGRAPHS

**Photograph 1. Landscape View of the Ventura River (January 2009).**

**Photograph 2. Location of the Proposed Outlet (January 2009).**

**Photograph 3. Landscape View of Project Area Eastward (January 2009).**

**Photograph 4. Dead End at Edison Drive (January 2009).**

**Photograph 5. Area for Proposed Channel (January 2009).**

**Photograph 6. Oak Woodland at Eastern End of Project Area (January 2009).**

# APPENDIX B:
# LIST OF PLANT SPECIES OBSERVED ONSITE

## Table B-1. Plant Species Observed During Surveys

| Scientific Name | Common Name | Origin |
|---|---|---|
| *Acer macrophyllum* | Bigleaf maple | Native |
| *Aesculus californicus* | California buckeye | Native |
| *Artemisia californica* | California sagebrush | Native |
| *Artemisia douglasiana* | Mugwort | Native |
| *Arundo donax** | Giant reed | Non-native |
| *Baccharis pilularis* | Coyote brush | Native |
| *Baccharis salicifolia* | Mule fat | Native |
| *Brassica nigra** | Black mustard | Non-native |
| *Bromus diandrus** | Ripgut brome | Non-native |
| *Bromus madritensis ssp. rubens** | Red brome | Non-native |
| *Citrus sinensis* | Sweet orange | Non-native |
| *Dudleya* sp. | Live-forever | Native |
| *Eriogonum fasciculatum* | California buckwheat | Native |
| *Eschscholzia californica* | California poppy | Native |
| *Eucalyptus globosus** | Blue gum eucalyptus | Non-native |
| *Foeniculum vulgare** | Fennel | Non-native |
| *Hedera helix** | English ivy | Non-native |
| *Heteromeles arbutifolia* | Toyon | Native |
| *Juglans californica* | California walnut | Native |
| *Lessingia filaginifolia* | California aster | Native |
| *Malva parviflora* | Cheeseweed | Non-native |
| *Marah fabaceus* | California manroot | Native |
| *Nicotiana glauca** | Tree tobacco | Non-native |
| *Phalaris aquatica** | Harding grass | Non-native |
| *Phoradendron* sp. | Mistletoe | Native |
| *Picris echioides** | Bristly ox-tongue | Non-native |
| *Pinus muricata* | Bishop pine | Native |
| *Platanus racemosa* | Sycamore | Native |
| *Quercus agrifolia* | Coast live oak | Native |
| *Rhus integrifolia* | Lemonadeberry | Native |
| *Rosa californica* | California wild rose | Native |
| *Rubus discolor** | Himalayan blackberry | Non-native |
| *Rumex crispus** | Curly dock | Non-native |
| *Salix lasiolepis* | Arroyo willow | Native |
| *Salvia mellifera* | Black sage | Native |

## Table B-1. Plant Species Observed During Surveys

| Scientific Name | Common Name | Origin |
|---|---|---|
| *Sambucus mexicanus* | Elderberry | Native |
| *Schinus molle** | Peruvian pepper tree | Non-native |
| *Silybum marianum** | Milk thistle | Non-native |
| *Solanum xanti* | Chaparral nightshade | Native |
| *Umbellularia californica* | California bay | Native |
| *Verbena lasiostachys* | Western vervain | Native |
| *Vicia* sp. | Vetch | Native |
| *Vinca major** | Greater periwinkle | Non-native |
| *Xanthium spinosum* | Spiny cocklebur | Non-native |

* Listed on the California Invasive Plant Council's Invasive Plant Inventory

# APPENDIX C:

# SPECIES FEDERALLY LISTED AND PROPOSED TO BE LISTED UNDER NMFS JURISDICTION WITH POTENTIAL TO OCCUR IN THE VICINITY OF THE FRESNO CANYON FLOOD MITIGATION SITE

## Table C-1. Species Federally Listed and Proposed for Listing Under NMFS Jurisdiction With Potential to Occur in the Fresno Canyon Flood Mitigation Site

| Taxon | Scientific Name | Common Name | Federal Status | Preferred Habitat | Likelihood of Occurrence in the Project area |
|---|---|---|---|---|---|
| Fish | *Oncorhynchus mykiss* | Southern California steelhead DPS | E | Pacific Ocean, spawns in coastal streams and rivers, over gravel beds. Pool depth, volume, amount of cover, and proximity to gravel for spawning play key roles. Federal listing includes populations from Santa Maria River south to southern extent of range (San Mateo Creek in San Diego County). | Known to occur in the Ventura River (CDFG 2009)<br>Designated critical habitat for this DPS includes the Ventura River (NMFS 2005) |

Source: USFWS species list for Ventura County, California, and CNDDB search for a 10-mile radius surrounding the project area

Key:

DPS = Distinct Population Segment

Federal Endangered Species Act

E = Endangered

**USFWS Biological Opinion (January 2010)**

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
81440-2009F-0490

January 6, 2010

Alessandro Amaglio
Regional Environmental Officer
U.S. Department of Homeland Security
1111 Broadway, Suite 1200
Oakland, California 94607-4052

Subject: Biological Opinion on the Fresno Canyon Flood Mitigation Project, Ventura County, California (PDM-PJ-09-CA-2007-013) (CON 8-8-09-F-60)

Dear Mr. Amaglio:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed funding by the Federal Emergency Management Agency (FEMA) of the Fresno Canyon Flood Mitigation Project (the Project) and its effects on the federally threatened California red-legged frog (*Rana aurora draytonii*) and the endangered least Bell's vireo (*Vireo bellii pusillus*) and southwestern willow flycatcher (*Empidonax traillii extimus*), in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 et seq.). Your September 8, 2009, request for formal consultation was received on September 10, 2009.

This biological opinion is based on information which accompanied your September 8, 2009, request for consultation, including the biological assessment (FEMA 2009), permit application (Ventura Public Works 2009), and information from our files. A complete administrative record of this consultation is available at the Ventura Fish and Wildlife Office.

## BIOLOGICAL OPINION

### DESCRIPTION OF THE PROPOSED ACTION

FEMA has proposed to provide Pre-Disaster Mitigation Program federal financial assistance (PDM-PJ-09-CA-2007-13) to the Ventura County Watershed Protection District (District) for the Fresno Canyon Flood Mitigation Project. The project would involve construction of a flood-control facility to transport water, sediment, and debris from Fresno Canyon to the Ventura River to reduce the risk of flooding in the community of Casitas Springs, Ventura County, California. The project area encompasses a portion of the Ventura River bank, Fresno Canyon Creek and

associated uplands, extending approximately 1,400 feet upstream of the Ventura River. State Highway 33 crosses Fresno Canyon Creek in the project area.

Construction and Maintenance

The proposed project would have a construction component and regular maintenance. The construction phase would require considerable grading and ground disturbance. Trenches up to 70 feet wide, 30 feet deep and 400 feet long would be dug, with 14,400 cubic yards of excavation and 14,900 cubic yards of backfill. Two maintenance and access road would be established outside of the manufactured channel, and some adjacent slopes would be excavated and shored to prevent collapse into the new channel. In general, the entire portion of Fresno Creek within the project area would be conveyed in box culverts or other man-made structures to convey all of the flows that could result from a 100-year rainfall event. Equipment would be staged in previously disturbed areas. Water diversion would be required for initial construction. Maintenance of the channel would be required following construction. If monitoring shows debris and/or sediment is potentially blocking the channel, it would be removed by accessing the channel from the upstream entrance. Some repair of the facilities may be required as wear and tear occurs.

Avoidance and Minimization Measures

The applicant proposes to implement the following measures to minimize adverse effects to the California red-legged frog, least Bell's vireos, and southwestern willow flycatcher. These are taken directly from the biological assessment (FEMA 2009) and except for some style changes, are cited verbatim from that document:

**California red-legged frog**

1. Work in the Ventura River will be limited to the period outside of the California red-legged frog breeding and bird nesting seasons. The construction window would be August 31 through October 31.

2. A qualified biologist will conduct pre-construction surveys at least 2 days prior to start of construction activities in areas where ground disturbance would occur to determine whether California red-legged frogs are present. If California red-legged frogs are found during any preconstruction surveys, the biologist will contact the Service to determine whether moving them is appropriate. If the Service gives approval for relocation, the Service-approved biologist will be allowed sufficient time to move the California red-legged frogs from the work site before activities begin.

3. A Service-approved biologist will monitor construction activities that involve retaining wall construction and installation of rock slope protection along the Ventura River channel bank. If California red-legged frogs are found that are likely to be killed or injured by work activities, the Service-approved biologist will be allowed sufficient time

to move them from the site before work activities resume. The Service-approved biologist will relocate the California red-legged frogs the shortest distance possible to suitable habitat that will not be affected by activities associated with the proposed project. Only California red-legged frogs that are at risk of injury or death by project activities will be moved.

4. Only Service-approved biologists will participate in activities associated with capture, handling, and monitoring of California red-legged frogs. The District will request and receive Service approval of any other biologist whom the agency wishes to conduct activities with California red-legged frogs.

5. If more than two California red-legged frogs are found dead or injured as a result of project activities within a 12-month period, the District will contact the Service immediately so the Service can review the project activities to determine whether additional protective measures are needed.

6. Exclusion fences composed of silt fence material will be installed at the margins of the work area to prevent workers from encroaching into adjacent habitat and to prevent California red-legged frogs from entering the construction area. A fine mesh (less than 0.40 inch) will be used to avoid entrapment of amphibians in the silt fence. The silt fence will be monitored periodically during construction to evaluate its effectiveness. All fencing in this area will be maintained for the duration of construction and removed on project completion.

7. To avoid attracting predators, food-related trash will be kept in closed containers and removed regularly from the project area.

8. To avoid transferring disease or pathogens, the Service-approved biologist will follow the Declining Amphibian Populations Task Force Fieldwork Code of Practice (attached).

9. Prior to construction, a qualified biologist will conduct training sessions to familiarize all construction personnel with the following: identification of California red-legged frogs, their habitat, general provisions and protections afforded by the Act, measures implemented to protect the species for this project, and a review of the project boundaries. This training will also be provided within 30 days of the arrival of any new worker.

10. If an injured California red-legged frog is found, the Service-approved biologist will determine the extent of the injury. If the injury is minor and the frog is likely to survive without treatment, the biologist will document the injury and release the frog in an appropriate location previously designated by the Service; however, if the injured frog requires professional treatment to survive, the biologist will transport the frog to the location where a qualified professional can provide the needed treatment. The location of a qualified professional to assist the frog will have been documented prior to the start of

construction. The treated frog will be released at an appropriate location as soon as its recovery allows. Within three working days, the injured frog incident will be reported to the Service and reported information will include date of injury, extent of injury, and action(s) taken. If a frog dies while being treated or a dead frog is located in the project area, the Service will be contacted within three working days. At that time, the Service will provide instructions regarding the deposition of the frog.

11. The District will provide the Service with a report on the results of biological surveys and sighting records and also document the following: the number of California red-legged frogs relocated from the project area or killed or injured during the proposed project; the dates and times of capture, mortality, or injury; specific locations of capture, mortality, or injury; approximate size and age of individuals; and a description of relocation sites.

12. All areas subject to temporary disturbance will be restored onsite with native riparian species to pre-project conditions upon completion of construction.

13. The District will take measures to prevent the introduction of invasive weeds at the construction site. This will include cleaning all equipment before bringing it onsite and using only certified, weed-free erosion control and revegetation materials.

The District will implement the following measures to prevent erosion, sedimentation, potential spills, and pollution:

14. Standard Best Management Practices and erosion control measures will be implemented during construction to minimize possible discharge of sediment into aquatic habitats. These measures will include, but will not be not limited to, installing and maintaining silt fences immediately down gradient of disturbed areas.

15. Erosion control and sediment detention devices (e.g., well-anchored sandbag cofferdams, straw bales, or silt fences) will be incorporated into the project design and implemented at the time of construction. These devices will be in place during construction activities, and after if necessary, for the purposes of minimizing fine sediment and sediment/water slurry input to flowing water and of detaining sediment laden water onsite. These devices will be placed at all locations where the likelihood of sediment input exists. Supply of erosion control materials will be kept on hand to cover small sites that may become bare and to respond to sediment emergencies.

16. The District will inspect the performance of sediment control devices at least once each day during construction to ensure that the devices are functioning properly. If a control measure is not functioning effectively, the control measure will be immediately repaired or replaced. Additional controls will be installed as necessary.

17. Sediment will be removed from sediment controls once the sediment has reached 1/3 of the exposed height of the control. Sediment collected in these devices will be disposed of away from the collection site at approved disposal sites.

18. All disturbed soils at each site will undergo erosion control treatment after construction is terminated. Treatment includes seeding and sterile mulch. Any disturbed soils on a gradient of more than 30 percent will have erosion control blankets installed.

19. Any stockpiles of soil used for fill material during construction will be covered with a tarp or erosion control blanket, and silt fences will be installed appropriately to contain soils from moving into area waterways. If the local weather forecast indicates there is greater than a 50 percent chance of rain, the project site will be "rain-proofed" with erosion control measures so that no sediment or turbidity enters the stream from the project footprint.

20. All debris, sediment, rubbish, vegetation, or other material removed from the channel banks, channel bottom, or sediment basins will be disposed of at an approved disposal site. All petroleum products, chemicals, silt, fine soils, and any substance or material deleterious to listed species will not be allowed to pass into, or be placed where it can pass into, the stream channel. No material will be sidecast into any waterway.

21. The District will exercise every reasonable precaution to protect the Ventura River from pollution with fuels, oils, bitumens, calcium chloride, and other harmful materials.

22. Construction by-products and pollutants such as petroleum products, chemicals, fresh cement, or deleterious materials will not be allowed to discharge into the Ventura River and will be collected and transported to an authorized disposal area.

23. A plan for the emergency clean-up of any spills of fuel or other material will be available onsite during construction activities.

24. Equipment will be refueled and serviced at designated construction staging areas. All construction material and fill will be stored and contained in a designated area that is located away from channel areas to prevent transport of materials into adjacent streams. A silt fence will be installed to collect any discharge, and adequate materials for spill cleanup will be maintained onsite.

25. Construction vehicles and equipment will be maintained to prevent contamination of soil or water (from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease).

26. Good housekeeping practices and use of safer alternative products, such as biodegradable hydraulic fluids, will be used to the extent feasible.

27. An employee training program will be implemented. Employees will be trained to prevent or reduce the discharge of pollutants from construction activities to waters and of the appropriate measures to take if a spill occurs.

28. In the event of a spill, work will stop immediately, spill control will be implemented, and the Service will be notified.

**Least Bell's Vireo and Southwestern Willow Flycatcher**

This section describes the avoidance and minimization measures necessary to protect the least Bell's vireo and southwestern willow flycatcher and their habitat.

29. To reduce adverse effects to the least Bell's vireo and southwestern willow flycatcher, the District will perform all construction activities in the Ventura River bed and bank outside of their nesting season (all construction activities east of State Route (SR) 33 may occur year round as SR33 presents a noise barrier from the river). Typically, construction activities would take place outside of the least Bell's vireo's nesting season, which extends from mid-March through late September, and the southwestern willow flycatcher's nesting season, which extends from mid-May through late August; however, because the Ventura River may also provide habitat to support federally listed anadromous fish species under the National Marine Fisheries Service's jurisdiction (in-water work window is June 15 through November 1), as well as the federally listed California red-legged frog under Service jurisdiction, the work window for construction activities near the Ventura River bed and bank has been modified to August 31 to October 31 as long as the following two measures are also implemented.

    a. A qualified biologist will conduct preconstruction surveys of all ground disturbance areas within riparian habitats to determine if least Bell's vireos and/or southwestern willow flycatchers are present prior to the start of construction. These surveys will be completed within 2 weeks prior to start of construction activities in the riparian zone. If least Bell's vireos and/or southwestern willow flycatchers are found nesting in the riparian zone during any preconstruction surveys, the qualified biologist will have stop work authority and stop construction activities in that area. Work activities would resume when the chicks have fledged and left the nest.

    b. A 250-foot buffer would be maintained around the riparian zone during the month of September if any least Bell's vireos are present. After September, no buffer would be applied because least Bell's vireo would have migrated out of the area by then. Any southwestern willow flycatchers would have left the area in late August.

**Measures to Avoid and Minimize Effects to California Red-legged Frog, Least Bell's Vireo, and Southwest Willow Flycatcher**

As discussed above, the proposed project has the potential to adversely affect suitable riparian habitat for the California red-legged frog and suitable nesting habitat for the least Bell's vireo and southwestern willow flycatcher. The riparian zone along the Ventura River bed and banks is considered suitable riparian habitat for the California red-legged frog and suitable nesting habitat for the least Bell's vireo and southwestern willow flycatcher and will therefore be protected. The following measures will be taken to avoid and minimize the potential adverse effects on habitat for these three federally listed species.

30. Disturbance to existing grades and vegetation will be limited to the actual site of the project and necessary access routes. Placement of all roads, staging areas, and other facilities will avoid and limit disturbance to streambank or stream channel habitat as much as possible. When possible, existing ingress or egress points will be used and the contours of the project area will be returned to pre-construction condition or better.

31. The District will, to the maximum extent practicable, reduce the amount of disturbance at a site to the absolute minimum necessary to accomplish the project. Whenever practicable, existing vegetation would be salvaged from the footprint of the project area and stored for replanting after earthmoving activities are completed.

32. The Dsitrict will restore the riparian habitat permanently lost at the outlet location during project construction project area through planting willows and other riparian species within the Ventura River's riparian zone in areas adjacent to the project area. Native willow species would be used for revegetation efforts. These revegetation efforts will be implemented at up to 3 to 1 ratio followed by a 5-year monitoring period to reach an 80 percent native species cover success criterion.

33. The District will take measures to prevent the introduction of invasive weeds at the construction site, including cleaning all equipment before bringing it onsite and using only certified weed-free erosion control and revegetation materials."

ANALYTICAL FRAMEWORK FOR THE JEOPARDY DETERMINATIONS

The jeopardy analyses in this biological opinion rely on four components: (1) the Status of the Species, which evaluates the range-wide condition of the California red-legged frog, least Bell's vireo, and southwestern willow flycatcher, the factors responsible for that condition, and their survival and recovery needs; (2) the Environmental Baseline, which evaluates the condition of the species in the action area, the factors responsible for those conditions, and the relationship of the action area to the survival and recovery of the three species; (3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the California red-legged frog, least Bell's

vireo, and southwestern willow flycatcher; and (4) the Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on the species.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed federal action in the context of the current status of the species, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the California red-legged frog, least Bell's vireo, or southwestern willow flycatcher in the wild.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the California red-legged frog, least Bell's vireo, and southwestern willow flycatcher, and the role of the action area in the survival and recovery of these species as the context for evaluation of the significance of the effects of the proposed federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

## STATUS OF THE SPECIES

### California red-legged frog

The California red-legged frog was federally listed as threatened on May 23, 1996 (61 FR 25813), and critical habitat was designated for the subspecies on April 13, 2006 (71 FR 19244). The Service completed a recovery plan for the subspecies in 2002 (Service 2002). Critical habitat for the California red-legged frog was first designated on March 13, 2001 (66 FR 14625). On November 6, 2002, the U.S. District Court for the District of Columbia set aside the designation and ordered the Service to publish a new final rule with respect to the designation of critical habitat for the California red-legged frog (*Home Builders Association of Northern California et al. versus Gale A Norton, Secretary of the Department of Interior et al.* Civil Action No. 01-1291 (RJL) U.S. District Court, District of Columbia.). The Service published a new proposed rule to designate critical habitat for the California red-legged frog on April 13, 2004 (69 FR 19620). Critical habitat for the California red-legged frog was re-designated on April 13, 2006 (71 FR 19244). On September 16, 2008, the Service proposed a new, revised rule to designate 1.8 million acres as critical habitat for the California red-legged frog, an area that is 300 percent larger than the 2006 designation for the subspecies (73 FR 53492). The Fresno Canyon project site is not within designated or proposed critical habitat and it will not be discussed further.

The California red-legged frog uses a variety of habitat types, including various aquatic systems, riparian, and upland habitats. The diet of California red-legged frogs is highly variable. Tadpoles eat algae and a variety of other items found on the bottom of the waterbody they inhabit (Jennings et al. 1992). Hayes and Tennant (1985) found invertebrates to be the most common food item of adults. Vertebrates, such as Pacific treefrogs (*Hyla regilla*) and California mice (*Peromyscus californicus*), represented over half of the prey mass eaten by larger frogs (Hayes and Tennant 1985). Feeding activity probably occurs along the shoreline and on the

surface of the water. Hayes and Tennant (1985) found juveniles to be active diurnally and nocturnally, whereas adults were largely nocturnal.

California red-legged frogs breed from November through March; earlier breeding has been recorded in southern localities (Storer 1925). Males appear at breeding sites from 2 to 4 weeks before females (Storer 1925). California red-legged frogs are often prolific breeders, typically laying their eggs during or shortly after large rainfall events in late winter and early spring. Female California red-legged frogs deposit egg masses on emergent vegetation so that the masses float on the surface of the water (Hayes and Miyamoto 1984). Egg masses contain about 2,000 to 5,000 moderately-sized (0.08 to 0.11 inch) in diameter, dark reddish brown eggs (Storer 1925, Jennings and Hayes 1985). Eggs hatch in 6 to 14 days (Storer 1925). Tadpoles undergo metamorphosis between 3.5 to 7 months after hatching (Storer 1925, Wright and Wright 1949). Sexual maturity can be attained at 2 years of age by males and 3 years of age by females and is usually reached at 3 to 4 years of age (Jennings and Hayes 1985); adults may live 8 to 10 years (Jennings et al. 1992) although the average life span is considered to be much lower. Juveniles have been observed to be active diurnally and nocturnally, whereas adults are mainly nocturnal. After breeding, California red-legged frogs often disperse from their breeding habitat to forage and seek suitable dry-season habitat. Cover within dry-season aquatic habitat could include boulders; downed trees; logs; agricultural features, such as drains, watering troughs, spring boxes, abandoned sheds, or hay-ricks; and industrial debris. California red-legged frogs use small mammal burrows and moist leaf litter (Rathbun et al. 1993, Jennings and Hayes 1994); incised stream channels with portions narrower and deeper than 18 inches may also provide habitat (61 FR 25813). However, this type of dispersal and habitat use is not observed in all California red-legged frogs and is most likely dependent on the year to year variations in climate and habitat suitability and varying requisites per life stage. For the California red-legged frog, dry-season habitat potentially includes all aquatic and riparian areas within the range of the subspecies and any landscape features that provide cover and moisture (61 FR 25813).

California red-legged frogs spend most of their lives in and near sheltered backwaters of ponds, marshes, springs, streams, and reservoirs. Deep pools with dense stands of overhanging willows and an intermixed fringe of cattails are considered optimal habitat. California red-legged frogs breed in aquatic habitats. Eggs, tadpoles, transformed juveniles, and adults also have been found in ephemeral creeks and drainages and in ponds that do not have riparian vegetation. California red-legged frogs frequently breed in artificial impoundments such as stock ponds, if conditions are appropriate. Although California red-legged frogs successfully breed in streams and riparian systems, high seasonal flows and cold temperatures in streams often make these sites risky environments for eggs and tadpoles. The importance of riparian vegetation for this species is not well understood. When riparian vegetation is present, California red-legged frogs spend considerable time resting and feeding in it; the moisture and camouflage provided by the riparian plant community likely provide good foraging habitat and may facilitate dispersal in addition to providing pools and backwater aquatic areas for breeding. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting population numbers and distribution.

Juvenile and adult California red-legged frogs may disperse long distances from breeding sites throughout the year. They can be encountered living within streams at distances exceeding 1.8 miles from the nearest breeding site, and have been found up to 400 feet from water in adjacent dense riparian vegetation (Bulger et al. 2003). Some California red-legged frogs have moved long distances over land between water sources during winter rains. Adult California red-legged frogs have been documented to move more than 2 miles in northern Santa Cruz County "without apparent regard to topography, vegetation type, or riparian corridors" (Bulger et al. 2003). Most of these overland movements occur at night. These individual frogs were observed to make long-distance movements that are straight-line, point to point migrations over variable upland terrain rather than using riparian corridors for movement between habitats. For the California red-legged frog, suitable habitat is considered to include all aquatic and riparian areas within the range of the species and includes any landscape features that provide cover and moisture (61 FR 25813).

California red-legged frogs have been found at elevations that range from sea level to about 5,000 feet. In the Sierra Nevada Mountains, California red-legged frogs typically occur below 4,000 feet in elevation (61 FR 25813).

The historical range of the California red-legged frog extended coastally from southern Mendocino County and inland from the vicinity of Redding, California, southward to northwestern Baja California, Mexico (Jennings and Hayes 1985, Storer 1925). The California red-legged frog has been extirpated or nearly extirpated from 70 percent of its former range. Historically, this subspecies was found throughout the Central Valley and Sierra Nevada foothills. At present, California red-legged frogs are known to occur in approximately 250 streams or drainages in 22 counties, primarily in central coastal California. Four additional occurrences have been recorded in the Sierra Nevada foothills since listing, bringing the total to five extant populations, compared to approximately 26 historical records (61 FR 25813). Currently, California red-legged frogs are known from three disjunct regions in 26 California counties and one region in Baja California, Mexico (Grismer 2002, Fidenci 2004, Smith and Krofta 2005). 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.

Over-harvesting, habitat loss, non-native species introduction, and urban encroachment are the primary factors that have negatively affected the California red-legged frog throughout its range (Jennings and Hayes 1985, Hayes and Jennings 1988). Habitat loss and degradation, combined with over-exploitation and introduction of exotic predators, were important factors in the decline of the California red-legged frog in the early to mid-1900s. Continuing threats to the California red-legged frog include direct habitat loss due to stream alteration and loss of aquatic habitat, indirect effects of expanding urbanization, competition or predation from non-native species including the bullfrog (*Rana catesbeiana*), catfish (*Ictalurus* spp.), bass (*Micropterus* spp.), mosquitofish (*Gambusia affinis*), red swamp crayfish (*Procambarus clarkii*), and signal crayfish. Chytrid fungus (*Batrachochytrium dendrobatidis*) is a waterborne fungus that can decimate amphibian populations, and is considered a threat to California red-legged frog populations.

Although the presence of California red-legged frogs is correlated with still water deeper than approximately 1.6 feet, riparian shrubbery, and emergent vegetation (Jennings and Hayes 1985), there are numerous locations in the species' historical range where these elements are well represented yet California red-legged frogs appear to be absent. The cause of local extirpations does not appear to be restricted solely to loss of aquatic habitat. The most likely causes of local extirpation are thought to be changes in faunal composition of aquatic ecosystems (i.e., the introduction of non-native predators and competitors) and landscape-scale disturbances that disrupt California red-legged frog population processes, such as dispersal and colonization. The introduction of contaminants or changes in water temperature may also play a role in local extirpations. These changes may also promote the spread of predators, competitors, parasites, and diseases.

Least Bell's Vireo

The least Bell's vireo was federally listed as endangered on May 2, 1986 (51 FR 16474). Critical habitat was designated for the least Bell's vireo on February 2, 1994 (59 FR 4845). The project site is not within designated critical habitat for this species and it will not be discussed further. A draft recovery plan was completed in 1998 (Service 1998). Additional information on the least Bell's vireo may be found in Wilbur (1980), Garrett and Dunn (1981), Miner (1989), Pike and Hays (1992), Zembal et al. (1985), and Service (1998).

The least Bell's vireo is a small, olive-grey migratory songbird that nests and forages almost exclusively in riparian woodland habitats. Bell's vireos as a group are highly territorial and almost exclusively insectivorous. Nesting habitat typically consists of well-developed overstories and understories, and low densities of aquatic and herbaceous cover. The understory frequently contains dense subshrub or shrub thickets. These thickets are often dominated by sandbar willow (*Salix hindsiana*), mulefat (*Baccharis salicifolia*), young individuals of other willow species such as arroyo willow (*S. lasiolepis*) or black willow (*S. gooddingii*), and one or more herbaceous species. Important overstory species include mature arroyo willows and black willows; occasional cottonwoods (*Populus* spp.) and western sycamores (*Platanus racemosa*) also occur in some habitats. Additionally, coast live oaks (*Quercus agrifolia*) can be a locally important overstory component, as can mesquite (*Prosopis* spp.).

Least Bell's vireos begin arriving from their wintering range in southern Baja California and establish breeding territories by mid to late March. They occupy home ranges that typically range in size from 0.5 to 7.5 acres. Following pair formation, it takes approximately 5 to 7 days to finish nest construction and egg-laying. Young typically fledge within 20 to 24 days after eggs are laid. The egg-laying and incubation periods are critical to nesting success as disturbance at this point may result in nest abandonment. Once young are fledged, they wander widely throughout the parents' territory. Most breeding least Bell's vireos depart their breeding grounds by the third week of September and few individuals winter in California.

Historically described as common to abundant in riparian habitats from as far north as Tehama County, California to northern Baja California, Mexico, the least Bell's vireo currently occupies

a small fraction of its former range, restricted now to eight counties in southern California and portions of northern Baja, Mexico. Widespread habitat losses have fragmented most remaining populations into small, disjunct, widely dispersed subpopulations. The decline of this species is attributed, in part, to the combined, perhaps synergistic effects of the widespread loss of riparian habitats and brood-parasitism by the brown-headed cowbird (*Molothrus ater*).

Southwestern Willow Flycatcher

The southwestern willow flycatcher was federally listed as endangered on February 27, 1995 (60 FR 10694) and critical habitat was designated for the subspecies on October 19, 2005 (70 FR 60886). The proposed project site is not within designated critical habitat. A recovery plan for the subspecies was completed in August 2002 (Service 2002a).

The southwestern willow flycatcher's current breeding range extends from southern California to western Texas, including portions of southernmost Nevada and Utah, southwestern Colorado, and northernmost Sonora and Baja California del Norte. Its current range is similar to the historical range, but the quantity of suitable habitat within that range has been much reduced from historical levels. The historical range of the southwestern willow flycatcher in California included all lowland riparian areas in the southern third of the state (Service 2002a). The flycatcher migrates to Mexico, Central, and possibly northern South America during the non-breeding season.

The southwestern willow flycatcher occurs in riparian woodlands along streams and rivers with mature, dense stands of willows (*Salix* spp.), cottonwoods, or smaller spring-fed areas with willows or alders (*Alnus* spp.). They forage within, and occasionally above, the canopy of riparian vegetation, taking insects on the wing or gleaning them from vegetation. Nesting habitat consists of even-aged, structurally homogeneous, and dense riparian vegetation (Brown 1988, Sedgwick and Knopf 1992). Historically, they nested primarily in willows and mulefat with a scattered overstory of cottonwood (Grinnell and Miller 1944). Following recent changes in riparian plant communities, nesting occurs in willows where available, but can also include thickets dominated by tamarisk (*Tamarix* spp.) and Russian olive (*Elaeagnus angustifolia*) (Brown 1988). Fragmented riparian zones with large distances between willow patches and individual willow plants are usually not selected for either nesting or singing (Sedgwick and Knopf 1992).

Southwestern willow flycatchers are typically present and singing on breeding territories by mid-May, although presence and status are often confused by migrating individuals of the northern subspecies (little willow flycatcher; *Empidonax traillii brewsteri*) passing through breeding habitat. The southwestern willow flycatcher builds nests and lays its eggs in late May to early June. They typically raise one brood per year, and clutch size is 3 to 4 eggs (Service 2002a). Fledglings depart the nest at the age of 12 to 15 days in early July and usually disperse from the natal territory at the age of 26 to 30 days. Some variation in these dates has been observed and may be related to altitude, latitude, and renesting. Territories range in size from 0.25 to 5.7 acres, although most are 0.5 to 1.2 acres (Service 2002a). Adults depart from breeding territories

in mid-August to early September. Sixty-six to 78 percent of breeding southwestern willow flycatchers known to have survived returned to the same breeding sites (Service 2002a).

The decline of the southwestern willow flycatcher is attributed to numerous factors, including nest depredation and brood parasitism by the brown-headed cowbird. However, large scale loss of southwestern wetlands, particularly cottonwood-willow riparian habitat, is the principal reason for the southwestern willow flycatcher's current status. Habitat loss is a result of urban and agricultural development, water diversion and impoundment, livestock grazing, and hydrological changes attributable to these and other land uses (60 FR 10694).

ENVIRONMENTAL BASELINE

The implementing regulations for section 7(a)(2) of the Act define the action area as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For the purposes of this biological opinion, we consider the action area to include all areas where people and equipment would be working or staging that may affect the environment, including habitat that could be used by the California red-legged frog, least Bell's vireo, or southwestern willow flycatcher. Based upon the information provided to us, we identify the action area as all portions of the project upon which ground disturbance would occur, either temporarily or permanently, including trenching, backfill, access and maintenance roads, aprons, access ramps, staging areas, the flapgate to the existing channel, and the main channel that is to be placed into a box culvert system. The biological assessment (FEMA 2009) and habitat measurements therein include a 100-foot buffer in habitat measurements. That buffer is included in the action area.

The action area is characterized by disturbed land and some native plant communities. Disturbed areas include development, agricultural lands, ornamental plantings, and existing roads that are either barren or dominated by non-native plant species, such as Himalayan blackberry (*Rubus discolor*), curly dock (*Rumex crispus*), and spiny cocklebur (*Xanthium spinosum*). Upland areas that are not disturbed support non-native grasslands, oak woodland, coastal sage scrub, and chaparral. Plant species indicative of these upland habitats include Harding grass (*Phalaris aquatica*), fennel (*Foeniculum vulgare*), coast live oak, California bay (*Umbellularia californica*), black sage (*Salvia mellifera*), California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis*), bush monkeyflower (*Mimulus aurantiacus*).

The main stem of Fresno Creek and the portion of the Ventura River included in the action area support river channel, riparian scrub and some oak woodland habitats. Typical plant species associated with these habitats on the project site include giant reed (*Arundo donax*), mulefat, sycamore, arroyo willow, mugwort (*Artemisia douglasiana*), tree tobacco (*Nicotiana glauca*), and coast live oak.

California red-legged frog

The California red-legged frog is known to occur in the Ventura River, although it has not been recorded specifically from the project site, primarily because no focused surveys have been performed. The biological assessment submitted with the request to initiate consultation (FEMA 2009) correctly assumes that the species could occur in the project area, and that good habitat is present at the confluence of the Fresno Creek and the river. Lacking specific survey data, we have no information on the numbers of California red-legged frogs that could be present in the action area. We anticipate that the numbers will be relatively low compared to other sites in the California red-legged frog's range due to the intermittent nature of the Ventura River and the scarcity of permanent or semi-permanent water features.

Least Bell's vireo

The Ventura River supports suitable nesting and foraging habitat for the least Bell's vireo. According to the BA (FEMA 2009), "High-quality habitat for this species is found at the outlet location of the proposed project and within the riparian zone of the river." Least Bell's vireos have been recorded in several parts of the Ventura River. For example, one breeding pair and two territorial males were observed in the Ventura River Basin both in 1993 and 1994 (Service 1998). In 1995, one breeding and one territorial male were observed in the same area. Other occurrences of least Bell's vireos in Ventura County include several to the south along the Santa Clara River and associated drainages, and in Santa Barbara County, most from the San Ynez River Basin. Neither the project area nor any area in the Ventura River Basin is within a designated recovery unit (Service 1998). The nearest recovery units are north (Santa Ynez River Metapopulation Unit) and south (Santa Clara River Metapopulation Unit) of the Ventura River Basin.

Despite a lack of specific survey data for the project site, given the habitat and location, it is likely that least Bell's vireos occur within the project area during the breeding season based on the available information. The number of birds the action area could support is estimated based upon the known range of territory size and the areal extent of suitable habitat in the action area. The biological assessment (FEMA 2009) states that riparian and river channel habitat in the action area totals 1.7 acres (with the 100-foot buffer). The average territory of a least Bell's vireo ranges from 0.5 to 7.5 acres (Service 1998). Assuming the minimum territory size applies (0.5 acre), the action area could support 3 to 4 least Bell's vireo territories or pairs (6 to 8 birds). We choose the upper limit because least Bell's vireos are known from areas near the project site, they have been experiencing a recent range expansion due to recovery efforts, and the habitat is considered suitable.

Southwestern willow flycatcher

According to the biological assessment, no documented occurrences of the southwestern willow flycatcher have been recorded within a 10-mile radius of the project area (FEMA 2009).

Although the biological assessment further states that no documented occurrences have been reported in Ventura County, our data indicate that the species occurs along the Santa Clara River and has been reported nesting from the Vern Freeman Diversion up to the Fillmore Fish Hatchery. We also have one unconfirmed potential nesting pair on the Ventura River downstream from Foster Park. We believe that the potential exists for the southwestern willow flycatcher to nest anywhere suitable habitat exists along the Ventura River.

The recovery plan for the southwestern willow flycatcher (Service 2002a) indicates that the project area is in the historical breeding range of the species but not within a recovery unit. The southwestern willow flycatcher has the potential to occur in the project area because the project area is in the southwestern willow flycatcher's historical range and provides suitable nesting and foraging habitat in the riparian zone of the Ventura River. Arrivals are typically in mid-May, and departures occur in late August.

Lacking specific information on the number of southwestern willow flycatchers present in the action area, we assume that any suitable habitat in the action area could be occupied, and that the number of pairs present during breeding season may be calculated from average territory size. Average territory size for the southwestern willow flycatcher ranges from 0.25 to 5.7 acres (Service 2002a). Assuming that potential southwestern willow flycatcher habitat in the action area includes riparian and river areas, the biological assessment places the total (with a 100-foot buffer) at 1.7 acres. Therefore, we estimate that the action area could support approximately 1 to 7 pairs of southwestern willow flycatcher. Given the scarcity of known occurrences along the Ventura River, the general status of the species, and the quality of habitat at the project site, we believe the potential number of pairs would be less than 7. Therefore, without better information, we estimate that action area could support up to 3 pairs of southwestern willow flycatchers during the breeding season.

## EFFECTS OF THE ACTION

### California red-legged frog

Direct impacts to adult and sub-adult California red-legged frogs in the action area could include injury or mortality from being crushed by grading equipment, construction debris, and worker foot traffic. These impacts will be reduced by minimizing and clearly demarcating the boundaries of the project areas and equipment access routes and locating staging areas outside of riparian areas or other water bodies. These effects will also be minimized by conducting awareness training sessions for workers, which will inform them of the presence and protected status of this species and the measures that are being implemented to protect it during project activities.

(Note: Although ongoing maintenance is included in the Project Description, it is not included in this analysis. FEMA's discretionary authority is limited in time and not likely to extend beyond the initial construction, therefore we cannot include those activities in our Effects Analysis.)

Direct impacts to California red-legged frogs would also be reduced by relocating California red-legged frogs, when found, prior to the start of construction activities. California red-legged frogs could be injured or killed if they are improperly handled or contained during capture and relocation efforts. California red-legged frogs that are relocated are at increased risk of predation, increased competition, and other factors associated with relocation to an unfamiliar environment. These effects will be reduced or prevented with the use of Service-approved biologists to capture and move California red-legged frogs to appropriate habitats; however, the District did not propose any measures on how biologists would be approved.

Trash left during or after project activities could attract predators to work sites, which could, in turn, prey on California red-legged frogs. For example, raccoons (*Procyon lotor*) are attracted to trash and also prey opportunistically on California red-legged frogs. This potential impact will be reduced or avoided by careful control of trash at all work sites.

Construction activities could cause increased siltation of both Fresno Creek and the Ventura River, thereby degrading California red-legged frog habitat downstream of the project site. The potential for this impact to occur will be reduced by implementing BMPs. Accidental spills of hazardous materials or careless fueling or oiling of vehicles or equipment could degrade aquatic or upland habitat to a degree where California red-legged frogs are adversely affected or killed; however, the District has proposed to implement measures to prevent such spills from reaching waterways, such as having staging and re-fueling areas away from the stream.

Some potential also exists for disturbance of habitat to cause the spread or establishment of non-native invasive plant species. Non-native species can out-compete native plant species and displace them, reducing habitat values for the California red-legged frog. The District proposal to clean equipment to prevent the spread of weed seeds may reduce this effect; however, it is likely that seeds already within the soil will be stimulated into germination by ground disturbance and removal of native plants.

Chytrid fungus (*Batrachochytrium dendrobatidis* ) is a water-borne fungus that is spread through direct contact between aquatic animals and by spores that are able to move short distances through water. The fungus attacks the thickened parts of a frog's skin that have keratin, such as the mouthparts of tadpoles and the toes of adults. This fungus can decimate amphibian populations by causing fungal dermatitis. Infection typically results in death within 1 to 2 weeks, but not before infected animals can spread the fungal spores to other aquatic species, ponds, and streams. Once a pond or waterway has become infected with chytrid fungus, it is unknown how long the fungus will persist. Chytrid fungus could be spread if infected California red-legged frogs are relocated and introduced into areas with healthy California red-legged frogs. It is also possible that infected equipment or clothing could introduce chytrid fungus into areas where it did not previously occur. If this occurs in the action area, many California red-legged

frogs could be affected. The District proposes to use the Declining Amphibian Population Task Force Code of Fieldwork Practice to reduce the chances that chytrid fungus would not be spread by project activities.

The District also proposes to take injured California red-legged frogs for professional treatment to survive. The monitoring biologist would transport the frog to the location where a qualified professional could provide the needed treatment. The location of a qualified professional to assist the frog will have been documented prior to the start of construction. Any successfully treated frog would be released at an appropriate location as soon as its recovery allows. We recommend that this measure not be pursued. Unfortunately, veterinarian treatment for amphibians is usually not successful, especially if the injuries are severe enough to warrant taking the animals from the wild. Also, removing a California red-legged frog from the wild and holding it in a facility and releasing back into the wild poses a regulatory problem that cannot be handled in a biological opinion. Lastly, the risk of disease transfer would be increased. We recommend that any injured California red-legged frogs be simply relocated as carefully as possible.

Least Bell's Vireo and Southwestern Willow Flycatcher

Both temporary and permanent loss of riparian and scrub habitat is expected as a result of the proposed project activities. The loss of habitat within a territory could diminish available foraging and sheltering habitat for the least Bell's vireo and southwestern willow flycatcher. Temporary or permanent loss of habitat may cause the species to seek out new territories and breeding sites. Moving to unfamiliar territory may expose individuals to exhaustion and starvation associated with decreased foraging opportunities, increased predation risk, inter- and intraspecific interactions, and decreased probability of nesting success. The District proposes to restore suitable habitat for these species at the Ventura River outflow, which will minimize the impacts to the least Bell's vireos and southwestern willow flycatcher.

If construction occurs when active nests are present in the action area, worker foot traffic and construction equipment could dislodge the nests and crush eggs. Fledglings in the action area could be flushed from protected areas by worker or construction vehicle movement, excessive noise, or physical impact. This threat would be minimized by the District’s proposal to conduct project activities outside of the breeding season and by having a qualified biologist conduct pre-construction surveys.

The least Bell’s vireo and southwestern willow flycatcher are sensitive to prolonged, loud noise. In addition, excessive airborne or deposited dust may degrade habitat to the point that it is no longer suitable for either species. Project activities causing noise and dust include hammering piles, creating rock groins, grading access routes, and moving vehicles on dirt roads. These activities would take place within suitable habitat for both species and may temporarily or permanently cause individuals to abandon eggs or juveniles, or vacate a territory. This could cause failure of a nesting attempt; death of eggs and fledglings; and expose adults to increased predation risk, greater inter- and intraspecific interactions, and decreased foraging opportunities.

This threat would be minimized by conducting project activities after the breeding season, having a qualified biologist conduct pre-construction surveys, and completing these activities in the shortest time possible, as proposed by the District.

Trash left during or after project activities could attract predators to work sites, which could prey on least Bell's vireos or southwestern willow flycatcher. For example, coyotes (*Canis latrans*) and raccoons are attracted to trash and could also prey opportunistically on either species. This potential impact will be reduced or avoided by the District's proposal to contain and control trash at all work sites.

Restoration efforts may provide an overall benefit to least Bell's vireos and southwestern willow flycatcher; however, noise, ground disturbance, and human presence may temporarily cause adverse effects to these species. This threat would be minimized or eliminated by the District's proposal to conduct restoration activities outside the breeding season.

## 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. We are unaware of any non-federal actions that are reasonably certain to occur in the action area.

## CONCLUSION

After reviewing the current status of the California red-legged frog, least Bell's vireo, and southwestern willow flycatcher, the environmental baseline for the action, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the Fresno Canyon Flood Mitigation Project, as proposed, is not likely to jeopardize the continued existence of the California red-legged frog, least Bell's vireo, and southwestern willow flycatcher. We have reached this conclusion for the following reasons:

1. The number of California red-legged frogs, least Bell's vireos, or southwestern willow flycatchers likely to be affected by projects activities will be very low.

2. The low number of individuals likely to be affected by the project will not appreciably reduce the likelihood of any of the species' survival and recovery because many more individuals and larger habitat areas outside of the action area will remain.

3. The District has proposed numerous and comprehensive measures to avoid and minimize potential effects.

4. The District proposes to restore habitat that could support all three species.

5. The project is being implemented in a manner that will minimize damage to areas that could support the California red-legged frog, least Bell's vireo, and southwestern willow flycatcher.

Critical habitat for these species has been designated in other parts of their ranges; however, this action does not affect any of those areas and no destruction or adverse modification of that critical habitat would occur as a result of the proposed project.

## INCIDENTAL TAKE STATEMENT

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

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

### California red-legged frog

The Service anticipates that incidental take of California red-legged frogs will be difficult to detect for the following reason(s): the species has a small body size; finding a dead or injured specimen is unlikely; losses may be masked by seasonal fluctuations in numbers or other causes; and the California red-legged frog occurs in habitat (water, dense vegetation) that makes detection difficult. The District proposes numerous measures to avoid and minimize the effects to the California red-legged frog; however, some take is likely to occur as a result of equipment movement, grading, and foot traffic. Also, all California red-legged frogs captured and relocated

are considered to be taken, although an exact number of captured individuals is impossible to estimate.

The District has proposed that if more than two California red-legged frogs are found dead or injured as a result of project activities within a 12-month period, the District will contact the Service immediately so we can review the project activities to determine whether additional protective measures are needed. We agree that this is a reasonable amount of take that can be anticipated, in addition to any California red-legged frogs taken by capture for relocation purposes.

Least Bell's vireo

We anticipate that few, if any, least Bell's vireos will be taken by the project activities. The entire area of suitable habitat that could support least Bell's vireos is relatively small (1.7 acres) and could support, at most, 3 to 4 pairs (6 to 8 birds). This many birds are unlikely to be at the project site due to the lack historical records of their occurrence in the area and the quality and extent of the habitat. Also, the District proposes to work only during the non-breeding season, which will avoid direct effects. We believe it is unlikely that any least Bell's vireos will be killed or injured by the action; however, the temporary loss of suitable nesting habitat may interfere with potential breeding, roosting and foraging behaviors of birds that return to the project area during the breeding season. By our estimate, up to 3 pairs (6 individuals) of least Bell's vireos could be taken as a result of temporary habitat loss.

Southwestern willow flycatcher

We anticipate that few, if any, southwestern willow flycatchers will be taken by the project activities. The entire area of suitable habitat that could support southwestern willow flycatchers is relatively small (1.7 acres) and could support, at most, 3 pairs or 6 birds. This many birds are unlikely to be at the project site due to the lack historical records of their occurrence in the area and the quality and extent of the habitat. Also, the District proposes to work only during the non-breeding season, which will avoid direct effects that could result in injury or mortality. We believe it is unlikely that any southwestern willow flycatchers will be killed or injured by the action; however, the temporary loss of suitable nesting habitat may interfere with potential breeding, roosting and foraging behaviors of birds that return to the project area during the breeding season. Therefore, we anticipate that the amount of take that may occur will be no more than 1 pair, or 2 birds due to habitat loss.

The exemption from the section 9 prohibitions on take described above do not extend to ongoing maintenance or repair. The take exemption is granted to FEMA while it retains discretionary authority over the project and while all other requirements of this biological opinion are being met by the District. Once FEMA’s discretionary authority lapses, the take exemption expires and any take that could result from maintenance after that time would not be exempted. Only if FEMA agrees to retain its discretionary authority for the life of the flood mitigation facilities would we be able to extend the take exemption.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize the impacts of the incidental take of the California red-legged frog.

> The District must seek Service approval of any biologists engaged in capture, handling, and relocation of California red-legged frogs. Although the project description includes using "Service-approved biologists" for a number of tasks, no mechanism for such approval is provided.

We believe that the avoidance and minimization measures proposed by the District are comprehensive and no other measures are required to address the potential for California red-legged frogs to be killed or injured by equipment or foot traffic, as long as all of the proposed measures are implemented. Also, we do not believe any reasonable and prudent measures are warranted for the least Bell's vireo and southwestern willow flycatcher given the source of incidental take we anticipate (temporary habitat loss) and because of the comprehensiveness of the proposed measures. The implementation by the District of the proposed avoidance and minimization measures is required and must be a binding part of any funding authorization provided by FEMA.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the District must comply with the following terms and conditions, which implement the reasonable and prudent measure described above and outline reporting and monitoring requirements. These terms and conditions are non-discretionary.

The following terms and conditions implement reasonable and prudent measure number 1:

1. At least 30 days prior to the onset of activities, the District must submit the names and credentials of biologists who would conduct activities specified in the avoidance and minimization measures proposed by the District. No project activities can begin until the District has received written approval from the Service that the biologists are qualified to conduct the work.

2. Biologists to be approved for monitoring or surveys must have demonstrable experience in identification of California red-legged frogs. If the biologist is proposed to conduct capture and relocation, that individual must also have experience with handling, transporting, and releasing California red-legged frogs. Biologists who have been approved in the past for such activities are most likely to be approved.

REPORTING REQUIREMENTS

The District provided several monitoring and reporting measures in its project description. The following reiterates those measures and expands upon them.

The District must provide a written annual report to the Service by January 27 of each year that this biological opinion is in effect. The report will document the number of California red-legged frogs, least Bell's vireos, or southwestern willow flycatchers killed or injured by project activities, if any. The report will also provide a summary of the previous year's activities and their effects on the California red-legged frog, least Bell's vireo, and southwestern willow flycatcher.

The report shall contain information on the following: (1) the type of activities that occurred in the action area (e.g., construction activities, monitoring); (2) the location of these activities; (3) a description of the habitat in which these activities occurred; (4) the number of California red-legged frogs captured and relocated; (5) the locations from which California red-legged frogs were moved and to which they were relocated; (8) the status of removal activities for exotic vegetation and habitat restoration; (9) the results of any surveys conducted for any listed species; (10) an analysis of the effectiveness of the avoidance and minimization measures and recommendations for future measures; and (11) any other pertinent information. The first report will be due the first January after the initiation of ground-disturbing activities. This reporting is not in lieu of reporting required immediately upon the take of California red-legged frog, least Bell's vireo, or southwestern willow flycatcher as described below.

DISPOSITION OF DEAD OR INJURED SPECIMENS

Within three days of locating any dead or injured California red-legged frogs, least Bell's vireos, or southwestern willow flycatchers, FEMA or the District must notify the Ventura Fish and Wildlife Office by telephone (805) 644-1766 and in writing (2493 Portola Road, Suite B, Ventura, California 93003). The report shall include the time and date, location of the carcass, cause of death, if known, likely source of injury, and any other pertinent information.

Care must be taken in handling dead specimens to preserve biological material in the best possible state for later analysis. Should any injured listed species survive, the Service must be contacted regarding their final disposition. The remains of listed species must be placed with educational or research institutions holding the appropriate State and Federal permits. For California red-legged frog, the appropriate institution is the Santa Barbara Natural History Museum (Contact: Paul Collins, Santa Barbara Natural History Museum, Vertebrate Zoology Department, 2559 Puesta Del Sol, Santa Barbara, California 93460, (telephone: (805) 682-4711, extension 321). Any specimens of least Bell's vireos or southwestern willow flycatcher must be placed with the Western Foundation of Vertebrate Zoology, 439 Calle San Pablo, Camarillo, California 93012 (telephone: (805) 388-9944). Other depositories may be authorized by the Service on a case-by-case basis.

Should any injured individuals of these species survive, the Service must be contacted regarding their final disposition.

## CONSERVATION RECOMMENDATIONS

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

> We recommend that the District have a biologist monitor the project site for a few years following completion of the action and restoration to determine if California red-legged frogs, least Bell's vireos, or southwestern willow flycatchers are using the area. This information would be valuable for planning future projects.

The Service requests notification of the implementation of this conservation recommendation so we may be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats.

## REINITIATION NOTICE

This concludes formal consultation on the action outlined in the Project Description section of this biological opinion. 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 retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat 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, please contact Rick Farris of our staff at (805) 644-1766, extension 316, or by electronic mail at rick_farris@fws.gov.

Sincerely,

/s/: Diane K. Noda

Diane K. Noda
Field Supervisor

# LITERATURE CITED


Brown, B.T. 1988. Breeding ecology of a willow flycatcher population in Grand Canyon, Arizona. Western Birds 19: 25-33.

Bulger, J.B., N.J. Scott, and R.B. Seymour. 2003. Terrestrial activity and conservation of adult California red-legged frogs *Rana aurora draytonii* in coastal forests and grasslands. Biological conservation 110 (2003):85-95.

Cachuma Operation and Maintenance Board. 2004. Final program and project specific environmental impact report/statement for the lower Santa Ynez River fish management plan and Cachuma project biological opinion for southern steelhead trout. Prepared by U.S. Department of the Interior, Bureau of Reclamation, Mid-Pacific Region, South-Central California Area Office, Fresno, California and COMB, Santa Barbara, California.

Cachuma Conservation Release Board. 2008. Biological Assessment. Fish Passage Improvements at Cross Creek Ranch – El Jaro Creek. Santa Barbara, California.

California Natural Diversity Data Base. 2003. Wildlife and Habitat Data Analysis Branch, California Department of Fish and Game. Sacramento, California.

California Natural Diversity Data Base. 2007. Rarefind: A database application for the California Department of Fish and Game, Natural Heritage Division data, California Natural Diversity Data Base, Sacramento.

California Department of Fish and Game. 2008. Rarefind: A database application for the California Department of Fish and Game, Natural Heritage Division data, California Natural Diversity Data Base, Sacramento.

California Natural Diversity Data Base. 2009. Wildlife and Habitat Data Analysis Branch, California Department of Fish and Game. Sacramento, California.

County of Santa Barbara. 2006. Creek Maintenance. Available on the internet at http://www.countyofsb.org/pwd/water/creek.htm. Visited on August 14, 2007

County of Santa Barbara. 2007. 2007-2008 Water Resources Annual Maintenance Plan. Available on the internet at http://www.countyofsb.org/pwd/water/annual_plan.htm. Visited on August 14, 2007.

Federal Emergency Management Agency (FEMA). 2009. Biological Assessment for USFWS: Fresno Canyon Flood Mitigation; Ventura County Watershed Protection District (PDMC-PJ-09-CA-2007-013). Dept. of Homeland Security, Oakland, CA.

Fidenci, P. 2004. The California red-legged frog, *Rana aurora draytonii*, along the Arroyo Santo Domingo, Northern Baja California, Mexico. The Herpetological Journal, Volume 88. London, England.

Garrett, K. and J. Dunn. 1981. Birds of Southern California: Status and Distribution. Los Angeles Audubon Society, California.

Grinnell, J. and A. Miller. 1944. The distribution of the birds of California. Pacific Coast Avifauna No. 27. Contribution from the Museum of Zoology of the University of California, Berkeley. Reprinted by Artemisia Press, Lee Vining, California, 1986. 617 pp.

Grismer, L. 2002. Reptiles and Amphibians of Baja California, Including its Pacific Island and the Islands in the Sea of Cortez. University of California Press, Berkley and Los Angeles, California.

Hayes, M.P. and M.M. Miyamoto. 1984. Biochemical, behavioral and body size differences between *Rana aurora aurora* and *R. a. draytonii*. Copeia 1984(4):1018-1022.

Hayes, M.P., and M.R. Tennant. 1985. Diet and feeding behavior of the California red-legged frog, *Rana aurora draytonii* (Ranidae). The Southwestern Naturalist 30(4):601-605.

Hayes, M.P. and M.R. Jennings. 1988. Habitat correlates of distribution of the California red-legged frog (*Rana aurora draytonii*) and the foothill yellow-legged frog (*Rana boylii*): Implication for management. Pp. 144-158. In proceedings of the symposium on the management of amphibians, reptiles, and small mammals in North America. R. Sarzo, K.E. Severson, and D.R. Patton (technical coordinators). U.S.D.A. Forest Service General Technical Report RM-166.

Jennings, M.R. and M.P. Hayes. 1985. Pre-1900 over harvest of California red-legged frogs (*Rana aurora draytonii*): The inducement for bullfrog (*Rana catesbeiana*) introduction. Herpetologica 31(1):94-103.

Jennings, M. 1988. Natural history and decline of native ranids in California. Pp. 1-143 *in* Proceedings of the conference on California herpetology. H.F. DeLise, P.R. Brown, B. Kaufman, and B.M. McGurty (editors), Southwestern Herpetologists Society Special Publication, 1-143.

Jennings, M.R. and M.P. Hayes. 1990. Status of the California red-legged frog *Rana aurora draytonii* in the Pescadero Marsh Natural Preserve. Report prepared for the California Department of Parks and Recreation, Sacramento, California. 30 pages + Tables and Figures.

Jennings, M.R., M.P. Hayes, and D.C. Holland. 1992. A petition to the U.S. Fish and Wildlife Service to place the California red-legged frog (*Rana aurora draytonii*) and the western pond turtle (*Clemmys marmorata*) on the list of endangered and threatened wildlife and plants. 21 pp.

Jennings, M.R., and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final report to California Dept. of Fish and Game. Pp. 12-16.

Lehman, P.F. 1994. The Birds of Santa Barbara County, California. Vertebrate Museum. University of California, Santa Barbara.

Licht, L.E. 1974. Survival of embryos, tadpoles, and adults of the frogs *Rana aurora aurora* and *Rana pretiosa pretiosa* sympatric in southwestern British Columbia. Can. J. Zool. 52:613-627. Mifflin Company, Boston, MA. 514 pp.

Miner, K.L. 1989. Foraging ecology of the least Bell's Vireo, *Vireo bellii pusillus.* Unpublished Masters Thesis, San Diego State University, San Diego, California.

Moyle, P.B., 2002. Inland fishes of California, revised and expanded. Second ed. University of California Press, Berkeley, California. 502 pp.

Nussbaum, R. A., Brodie, E. D. Jr., and Storm, R. M. 1983. Amphibians and Reptiles of the Pacific Northwest. Univ. Idaho Press, Moscow, Idaho.

Pike, J. and L. Hays. 1992. The status and management of the least Bell's vireo within the Prado Basin, California, 1986-1991. Unpublished report, California State University, Long Beach Foundation and U.S. Fish and Wildlife Service, Laguna Niguel, California.

Rathbun, G.B., M.R. Jennings, T.G. Murphey, and N.R. Siepel. 1993. Status and ecology of sensitive aquatic vertebrates in lower San Simeon and Pico Creeks, San Luis Obispo County, California. U.S. Fish and Wildlife Service, National Ecology Research Center, San Simeon, California. Prepared for the California Department of Parks and Recreation. 103 pp.

Rathbun, G.B., and J. Schneider. 2001. Translocation of California red-legged frogs (*Rana aurora draytonii*). Wildlife Society Bulletin 29:1300-1303.

Reis, D.K. 1999. Habitat characteristics of California red-legged frogs (*Rana aurora draytonii*): Ecological differences between eggs, tadpoles, and adults in a coastal brackish and freshwater system. Master's thesis submitted to San Jose State University, San Jose, California.

Schmieder, R.R. and R.S. Nauman. 1994. Effects of non-native aquatic predators on premetamorphic California red-legged frogs (*Rana aurora draytonii*). University of California, Santa Cruz. 12pp.

Scott, N. 2002. Annual Report, California red-legged frog, *Rana aurora draytonii*, Permit TE-036501-4. Unpublished report submitted to the Ventura Fish and Wildlife Office.

Sedgwick, J.A. and F.L. Knopf. 1992. Describing willow flycatcher habitats: scale perspectives and gender differences. Condor 94:720-733.

Shaffer, H.B., G.M. Fellers, S.R. Voss, J.C. Oliver, and G.B. Pauly. 2004. Species boundaries, phylogeography and conservation genetics of the red-legged frog (*Rana aurora/draytonii*) complex. Molecular Ecology 13:2667–2677.

Smith, R. and D. Krofta. 2005. Field notes documenting the occurrence of California red-legged frogs in Baja California, Mexico. In litt.

Sogge, M.K., R.M. Marshall, S.J. Sferra, and T.J. Tibbitts. 1997a. A Southwestern Willow Flycatcher Natural History Summary and Survey Protocol. USDI National Park Service, Colorado Plateau Research Station at Northern Arizona University. Technical Report NPS/NAUCPRS/NRTR-97/12.

Stebbins, R.C. 1985. A field guide to western reptiles and amphibians. Houghton Mifflin Company, Boston, Massachusetts.

Storer, T.I. 1925. A synopsis of the Amphibia of California. University of California Publications in Zoology 27:1-342.

Twedt, B. 1993. A comparative ecology of *Rana aurora* (Baird and Girard) and *Rana*

U.S. Bureau of Reclamation. 2003. Biological assessment for fish passage enhancement projects on Salsipuedes Creek and Quiota Creek and a demonstration project on El Jaro Creek. Prepared by U.S. Department of the Interior, Bureau of Reclamation, Mid-Pacific Region, South-Central California Area Office. Fresno, California.

U.S. Fish and Wildlife Service. 1998. Draft Recovery Plan for the least Bell's vireo (*Vireo bellii pusillus*). Portland, Oregon.

U.S. Fish and Wildlife Service. 1998. Draft recovery plan for the least Bell's vireo (*Vireo bellii pusillus*). Portland, Oregon. 139 pp.

U.S. Fish and Wildlife Service. 1999. Programmatic formal Endangered Species Act consultation on issuance of permits under section 404 of the Clean Water Act of authorizations under the Nationwide Permit Program for projects that may affect the California red-legged frog. Dated January 26, 1999. Issued to: Art Champ, U.S. Army Corps of Engineers, Sacramento District, Sacramento, California; Calvin Fong, U.S. Army Corps of Engineers, San Francisco District, San Francisco, California; and Richard

Schubel, U.S. Army Corps of Engineers, Los Angeles District, Los Angeles, California. Issued by: Ventura and Sacramento Fish and Wildlife Offices, Ventura and Sacramento, California.

U.S. Fish and Wildlife Service. 2002. Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service , Portland, Oregon. viii + 173 pp.

U.S. Fish and Wildlife Service. 2002a. Final recovery plan for the southwestern willow flycatcher (*Empidonax traillii extimus*). Albuquerque, New Mexico. i-ix + 210 pp., Appendices A-O.

Unocal. 2004a. Guadalupe restoration project: Ecological monitoring report. 1st Quarter 2004. May 2004. Unpublished. Guadalupe, California.

Unocal. 2004b. Guadalupe restoration project: Ecological monitoring report. 2nd Quarter 2004. August 2004. Unpublished. Guadalupe, California.

Unocal . 2004c. Guadalupe restoration project: Ecological monitoring report. 3rd Quarter 2004. November 2004. Unpublished. Guadalupe, California.

Unocal. 2004d. Guadalupe restoration project: Habitat inventory and ecological database. November 2004. Unpublished. Guadalupe, California.

URS Group, Inc. 2008. Final Biological Assessment for USFWS: Slope and Road Repair at Swanton, PM 4.99, County of Santa Cruz. FEMA-1646-DR-CA, PW #2749. Report prepared for U.S. Department of Homeland Security, Federal Emergency Management Agency.

Ventura County Public Works. 2009. Application for Pre-Disaster Mitigation Funding from FEMA through the California Emergency Management Agency.

Whitfield, M.J., K. Enos, and S. Rowe. 1997. Reproductive response of the Southwestern Willow Flycatcher (*Empidonax traillii extimus*) to the removal of Brown-headed Cowbirds. Draft Report prepared for U.S. Army Corps of Engineers, Sacramento District, and Calif. Dept. of Fish and Game, Wildlife Manage. Div., Bird and Mammal Conservation Program.

Wilbur, S. 1980. Status report on the least Bell's vireo. Unpublished report. U.S. Fish and Wildlife Service. Portland, Oregon.

Wright, A.H. and A.A. Wright. 1949. Handbook of frogs and toads of the United States and Canada. Comstock Publishing Company, Inc., Ithaca, NY. xii + 640 pp.

Zembal, R., K. Kramer and R. Bransfield. 1985. Survey of Vegetation and Vertebrate Fauna in the Prado Basin and the Santa Ana River Canyon, California. Unpublished report, U.S. Fish and Wildlife Service, Laguna Niguel, California.

**The Declining Amphibian Populations Task Force Fieldwork Code of Practice**

1. Remove mud, snails, algae, and other debris from nets, traps, boots, vehicle tires, and all other surfaces. Rinse cleaned items with sterilized (e.g., boiled or treated) water before leaving each study site.

2. Scrub boots, nets, traps, and other types of equipment used in the aquatic environment with 70 percent ethanol solution or a bleach solution of one-half to one cup of bleach in one gallon of water and rinse clean with sterilized water between study sites. Avoid cleaning equipment in the immediate vicinity of a pond, wetland, or riparian area.

3. In remote locations, clean all equipment with 70 percent ethanol or a bleach solution, and rinse with sterile water upon return to the lab or a "base camp." Elsewhere, when laundry facilities are available, remove nets from poles and wash (in a protective mesh laundry bag) with bleach on a "delicate" cycle.

4. When working at sites with known or suspected disease problems, or when sampling populations of rare or isolated species, wear disposable gloves and change them between handling each animal. Dedicate separate sets of nets, boots, traps, and other equipment to each site being visited. Clean and store them separately at the end of each field day.

5. Safely dispose of used cleaning materials and fluids. Do not dispose of cleaning materials and fluids in or near ponds, wetland, and riparian areas; if necessary, return them to the lab for proper disposal. Safely dispose of used disposable gloves in sealed bags.

6. When amphibians are collected, ensure the separation of animals from different sites and take great care to avoid indirect contact (e.g., via handling or reuse of containers) between them or with other captive animals. Do not expose animals to unsterilized vegetation or soils which have been taken from other sites. Always use disinfected and disposable husbandry equipment.

7. If a dead amphibian is found, place it in a sealable plastic bag and refrigerate (do not freeze). If any captured live amphibians appear unhealthy, retain each animal in a separate plastic container that allows air circulation and provides a moist environment from a damp sponge or sphagnum moss. For each collection of live or dead animals, record the date and time collected, location of collection, name of collector, condition of animal upon collection, and any other relevant environmental conditions observed at the time of collection. Immediately contact the Ventura Fish and Wildlife Office at (805) 644-1766 for further instructions.

The Fieldwork Code of Practice has been produced by the Declining Amphibian Populations Task Force with valuable assistance from Begona Arano, Andrew Cunningham, Tom Langton, Jamie Reaser, and Stan Sessions. For further information on this Code, or on the Declining Amphibian Populations Task Force, contact John Wilkinson, Biology Department, the Open University, Walton Hall, Milton Keynes, MK7 6AA, UK.

Email: DAPTF@open.ac.uk
Fax: +44 (0)

Biological Assessment for NMFS

# Fresno Canyon Flood Mitigation

Ventura County Watershed Protection District

PDMC-PJ-09-CA-2007-013

*July 2013*

FEMA

**Federal Emergency Management Agency**
**Department of Homeland Security**
1111 Broadway, Suite 1200
Oakland, California 94607

# Final Biological Assessment

# For NMFS

## Fresno Canyon Flood Mitigation Project
## Ventura County Watershed Protection District

**PDMC-PJ-09-CA-2007-013**

**Prepared by:**

Impact Sciences, Inc.
803 Camarillo Springs Road, Suite C
Camarillo, California 93012
Contact: Dave Crawford

**July 2013**

# TABLE OF CONTENTS

# LIST OF FIGURES



**Appendices**

# LIST OF ACRONYMS

| | |
|---|---|
| °F | degrees Fahrenheit |
| amsl | above mean sea level |
| BMPs | Best Management Practices |
| BO | Biological Opinion |
| CalEMA | California Emergency Management Agency |
| CDFW | California Department of Fish and Wildlife |
| CMP | Congestion Management Program |
| CNDDB | California Natural Diversity Database |
| CNPS | California Native Plant Society |
| DPS | Distinct Population Segment |
| EIR | Environmental Impact Report |
| ESA | Endangered Species Act of 1973 |
| FEMA | Federal Emergency Management Agency |
| FWS | US Fish and Wildlife Service |
| LARWQCB | Los Angeles Regional Water Quality Control Board |
| NMFS | National Marine Fisheries Service |
| NRCS | Natural Resources Conservation Service |
| OVSD | Ojai Valley Sanitation District |
| PDM | Pre-disaster Mitigation |
| RC | reinforced concrete |
| SR | State Route |
| URS | URS Group, Inc. |
| USACE | US Army Corps of Engineers |
| USFWS | US Fish and Wildlife Service |
| USGS | US Geological Survey |
| VCWPD | Ventura County Watershed Protection District |

# EXECUTIVE SUMMARY

The Department of Homeland Security's Federal Emergency Management Agency (FEMA) proposes to provide Pre-disaster Mitigation (PDM) Program Federal financial assistance (Federal action) (PDM-PJ-09-CA-2007-013) to the Ventura County Watershed Protection District (VCWPD/District) (Subgrantee), through the California Emergency Management Agency (CalEMA), in support of the Fresno Canyon Flood Mitigation Project (proposed action). The Subgrantee's proposed action to construct a flood-control drainage facility to transport floodwater, sediment, and debris from Fresno Canyon to the Ventura River is intended to reduce the risk of flooding in the community of Casitas Springs in Ventura County, California, and on State Route (SR) 33.

This report is a supplement to the 2009 Draft Biological Assessment that was prepared for FEMA to be submitted to National Marine Fisheries Service (NMFS) for the evaluation of resources that are under their jurisdiction. This report provides updated information and a complete analysis of existing and potentially occurring biological resources and potential effects of the federal action and the Subgrantee's proposal on species that are listed or proposed for listing under the Endangered Species Act of 1973 (ESA) (16 USC Subsection 1531-1544 [2007]) and that are under the jurisdiction of NMFS.

Following field surveys and background literature review, it was determined that the action area provides suitable habitat for one federally listed endangered species under NMFS jurisdiction; the Southern California steelhead trout (*Oncorhynchus mykiss*) Distinct Population Segment (DPS). Additionally, the action area is located within the Ventura River Hydrologic Unit (4402), identified as designated critical habitat for the Southern California steelhead (NMFS 2005).FEMA has made the determination that with implementation of avoidance measures and project specific best management practices, the proposed action is not likely to adversely affect the Southern California steelhead trout DPS. Minimal effects to critical habitat would occur with construction and operation, but with implementation of restoration mitigation, the action would not adversely affect the steelhead critical habitat.

# SECTION 1 INTRODUCTION

The Department of Homeland Security's Federal Emergency Management Agency (FEMA) proposes to provide Pre-disaster Mitigation (PDM) Program Federal financial assistance (Federal action) (PDM-PJ-09-CA-2007-013) to the Ventura County Watershed Protection District (VCWPD) (Subgrantee), through the California Emergency Management Agency (CalEMA), in support of the Fresno Canyon Flood Mitigation Project (proposed action). The Subgrantee's proposed action to construct a flood-control drainage facility to transport floodwater, sediment, and debris from Fresno Canyon to the Ventura River is intended to reduce the risk of flooding in the community of Casitas Springs in Ventura County, California, and on State Route (SR) 33.

In 2009, URS Group, Inc. (URS) prepared a Draft Biological Assessment for FEMA to be submitted to National Marine Fisheries Service (NMFS) for evaluation of resources that are under their jurisdiction. The US Fish and Wildlife Service (FWS) was also consulted with respect to special-status resources under their jurisdiction. The FWS subsequently prepared a Biological Opinion (BO) in January 2010 addressing potential effects of the proposed action on the federally threatened California red-legged frog (*Rana draytonii*), the federally endangered least Bell's vireo (*Vireo bellii pusillus*), and southwestern willow flycatcher (*Empidonax traillii extimus*) in accordance with Section 7 of the Endangered Species Act of 1973, as amended (Act) (16 USC 1531 et seq.).

The purpose of this report is to supplement the 2009 Draft Biological Assessment. This report provides updated information and complete analysis of existing and potentially occurring biological resources and potential effects of the federal action and the Subgrantee's proposal on species that are listed or proposed for listing under the Endangered Species Act of 1973 (ESA) (16 USC Subsection 1531-1544 [2007]) and that are under the jurisdiction of the NMFS. The potential effects on federally listed species have been evaluated in accordance with Section 7 of the ESA (16 USC Section 1536). Measures to avoid and/or minimize take or disturbance to potentially affected species are included in the report.

Because this is an update to the 2009 Biological Assessment prepared by URS,[1] portions of that report are incorporated into this document verbatim without repeated citation. In addition to the June 2009 URS Biological Assessment, this analysis is based on the September 2007 Initial Study for the proposed action, the Biological Opinion prepared by US Fish and Wildlife Service for the subject project, review of relevant literature and data, and recent field studies on and adjacent to the subject action area.

1 FEMA. Draft Biological Assessment for NMFS; Fresno Canyon Flood Mitigation; Ventura County Watershed Protection District; PDMC-PJ-09-CA-2007-013. Prepared by URS Group, Inc. June 2009.

## 1.1 PURPOSE AND NEED

The existing flood-control channel in Casitas Springs is inadequate for the proper transport of water and debris associated with flood events. Storm water and debris flows from Fresno Canyon flooded the community of Casitas Springs in Ventura County, California three times between 1995 and 2005, damaging dozens of homes and requiring the closure of SR 33 for up to two days during each flood event. An average of more than 24,500 vehicles travel on SR 33 in the Casitas Springs area every day.[2] Residential areas on both sides of Fresno Canyon are subject to flooding at an estimated frequency of once every 10 years. In addition, the flood-control channel clogs and overflows frequently, and water from the Ventura River frequently flows up the channel, creating a "backwater effect" that floods property adjacent to the channel.[3]

Future storm events in the Casitas Springs area are likely to result in more flooding. The cost of repairing the damage from 100- or 50-year flood events to residences and other property in Casitas Springs is projected to exceed $2 million. Less intense flood events, if accompanied by a large amount of debris, could also cause flood damage in Casitas Springs and require the temporary closure of SR 33.

Under authority of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 USC 5121 et seq.) and CFR Title 44, FEMA's PDM program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. The purpose of the proposed action is to provide PDM funding to the VCWPD to reduce the risk of flood hazards in Casitas Springs and on SR 33.

2 Caltrans (California Department of Transportation). Caltrans Traffic Operations Division. Annual Average Daily Traffic for California State Highway 33. Available at http://traffic-counts.dot.ca.gov/. 2011.

3 Ventura County Watershed Protection District (VCWPD). Fresno Canyon Flood Mitigation Pre-Design Study Final Report. Prepared for Ventura County Watershed Protection District. Prepared by Hawks & Associates, West Coast Environmental Engineering, and Earth Systems. 2007.

# SECTION 2 DESCRIPTION OF THE PROPOSED ACTION

## 2.1 ACTION AREA

As defined by the ESA (50 CFR Part 402.2), the action area includes the limits of direct and indirect effects of the proposed action on federally listed species.

The action area is located approximately 5 miles inland from the Pacific Ocean in the community of Casitas Springs in Ventura County, California, immediately north (upstream) of Foster Park (**Figure 1**). Moreover, the action area is on the eastern bank of the Ventura River south of the existing flood-control channel. The action encompasses a small section of the Ventura River bank and extends approximately 1,400 feet east of the Ventura River on to adjacent uplands and a surrounding 100-ft buffer. The uplands include some riparian areas, residential areas, and a crossing of SR 33 (**Figure 2**).

## 2.2 PROPOSED ACTION

The VCWPD is proposing to construct a bypass storm drain facility to transport floodwaters, sediment, and debris from Fresno Canyon to the Ventura River to reduce the risk of flooding in the community of Casitas Springs. The facility will be designed to convey the fully bulked flows resulting from a 100-year flood event. The project design has incorporated some changes since the 2009 Biological Assessment. Mainly, instead of constructing an extended box culvert and open rectangular channel, the proposed action includes a 12-foot-diameter reinforced concrete (RC) conveyance pipe installed via horizontal boring beneath SR 33 and via open trench method for the remaining approximately 395 linear feet. Installing a 12-foot-diameter RC pipe underneath SR 33 using a horizontal boring method minimizes potential environmental impacts and avoids the need to detour traffic on SR 33 during construction.

Starting at the upstream end, the proposed action includes installation of a 265-foot floodwall above the northwest bank of the existing natural canyon. To protect the floodwall from potential scour damage, non-grouted rock riprap would be placed on the adjacent portion of the northwest bank. The inlet consists of a 50-foot-long rock riprap trapezoidal channel with 2 to 1 horizontal to vertical (2H:1V) side slopes (50-foot top width, 11-foot bottom width) and approximately 100 linear feet of RC transition structure adjacent to the existing detention basin.

Where the proposed bypass and existing natural channel diverge, a notch in the north RC channel wall would allow emergency overflows to leave the bypass channel and enter the natural channel. Concrete rock riprap would be placed in the natural channel for a length of 40 feet to protect against erosion and would essentially function as an emergency spillway. This modified natural channel section would be trapezoidal with 2H:1V side slopes, top width of 51 feet, and bottom width of 15 feet.

The transition structure connects to approximately 580 linear feet of 12-foot diameter RC pipe which would be jacked under SR 33 using a horizontal boring method. The jacking will be continued for about 145 linear feet west of SR 33, where the pipe would be day-lighted and from there on it would be installed by open trench method for the remainder of the distance (i.e., approximately 395 feet) to the outlet apron comprised of 1-ton non-grouted rock riprap to be constructed on the left bank of the Ventura River. The existing retaining wall located along the base of slope at the terminus of Edison Drive would be removed and a new retaining wall (of varying height) would be constructed on either side of the pipe conveyance alignment. **Figure 3** illustrates an overlay of the proposed action.

A 120-foot-long by 6-inch-wide RC retaining wall (height varies) would be installed along the downstream edge of the Ojai Valley Trail beginning about 70 feet north of and ending about 35 feet south of the conveyance structure. The retaining wall is required to support the trail, a portion of which would need to be elevated to clear the proposed 12-foot-diameter pipe. The wall would include an underground RC footing (dimensions to be determined based on a pending geotechnical investigation) for proper anchoring.

Immediately west of the Ojai Valley Trail, the pipe would connect to a 40-foot-long trapezoidal outlet apron on the east bank of the Ventura River. The apron would comprise one-ton un-grouted rock riprap and would be 30 feet wide at the invert, 50 feet wide at the top, and 4 feet deep. A 4-foot-wide non-grouted rock cutoff wall that would extend 5 feet deeper underground would further stabilize the downstream edge of the outlet apron, increasing the total depth of rock at this edge to 9 feet. The ground immediately west of the outlet apron would be bladed or graded for approximately 70 feet to facilitate flows from the facility into the Ventura River.

A pair of existing 42-inch corrugated metal pipe culverts conveying flow from private property east of the Ojai Valley Trail would be replaced with a single 48-inch RC pipe terminating at the proposed outlet.

To prevent the backwater effect from the Ventura River in the existing flood-control channel, a flapgate would be constructed at the outlet of the flood-control channel that would prevent river water from traveling up the channel. Because the flood-control channel serves as a wildlife corridor from the Ventura River to Fresno Canyon, a pathway around the flapgate would be constructed to allow wildlife to enter the channel.

The proposed action would include construction of two maintenance roads surfaced with 6-inch aggregate base. A 15-foot-wide maintenance access road would extend from SR 33 west over the buried pipeline alignment to the outlet structure. An access turn radius on uplands immediately west of the Ojai Valley Trail would be required for maintenance equipment access to the outlet invert. The voids within a 15-foot-wide portion of the non-grouted rock on the outlet structure's north slope would be filled with 6-inch aggregate base to create a drivable ramp from the turn radius down to the outlet invert. The access ramp would lie adjacent and parallel to the Ojai Valley Trail.

A second maintenance road would be constructed at the eastern end of the facility and immediately north of the proposed floodwall. It would be approximately 265 feet long and connect to an existing access route from SR 33.

The proposed action would require relocation of the existing 21-inch sewer line operated by the Ojai Valley Sanitation District (OVSD). As part of the proposed action, a new sewer line would be constructed 1 to 2 feet north of the existing line to allow for OVSD access and maintenance. The old line will be abandoned in place. A new sewer manhole will be added at the end of Edison Drive and another manhole will be added along the sewer line just west of the Ojai bike trail and south of the new outlet.

The existing 36-inch Parkview Drain located southeast of SR 33 would be connected to the new Fresno Canyon conveyance structure.

To summarize, project construction features include:

- New inlet structure with emergency spillway/rock riprap protection in Fresno Canyon, upstream (east) of SR 33

- Flood wall and adjacent rock riprap revetment along the northwest bank of the existing natural canyon (about 242 feet long)
- 12-foot diameter RC conveyance pipe (approximately 975 feet long)
- RC retaining wall with footing along the west edge of the Ojai Valley Trail (about 120 feet long)
- Outlet facility with tie-in to adjacent high ground on the north and south, cut-off wall along the west edge, and cut-off wall at the downstream edge of the south tie-in, all consisting of ungrouted 1-ton rock riprap
- Graded flow path extending 70 feet westward from the outlet facility
- New RC pipe culvert to replace existing Congestion Management Program (CMP) culverts draining private property east of the Ojai Valley Trail
- Maintenance road from SR 33 west to the outlet structure over the pipeline alignment with a minimal access turn radius on uplands immediately west of the Ojai Valley Trail
- Maintenance road for access from SR 33 east to the new inlet structure
- Flapgate on existing Fresno Canyon outlet with wildlife pathway

The proposed action description is based on the 50 percent construction drawings dated March 2013. The design drawings are included as **Appendix 1**.

Project construction is tentatively anticipated for 2014 and will take approximately 150 working days to complete. As-built plans and an updated Operations, Maintenance, and Repair Manual (if needed) shall be completed within six months of project construction completion and submitted to all regulatory agencies for comment and approval.

### 2.2.1 Operations and Maintenance

A draft operation, maintenance and repair manual[4] (manual) has been prepared for the proposed action that identifies all actions that will be required to operate and maintain all aspects of the flood mitigation project including both the existing box culvert and new bypass channel. The draft manual has been updated to address the proposed design and will be finalized to meet all the requirements of the final approved project.

#### *Operations, Inspections, Maintenance of Project Components*

Operations involve all activities required to maintain unobstructed flow within the bypass channel, inlet, and outlet. The system is designed to operate passively, without manual or remote actions. Periodic inspections by qualified staff will detect and quantify any conditions within the bypass channel system,

4 Ventura Watershed Protection District. Operation, Maintenance and Repair Manual; Fresno Canyon Flood Mitigation Project, Casitas Springs, Ventura County, California. Project No. 81182. April 2013 (Draft).

including access roads, which either adversely affect the project's authorized function, or adversely affect the natural resources of either Fresno Creek or the Ventura River. Maintenance is defined as the routine conditioning of system components and the correction of any conditions within the bypass system that might adversely affect the project's authorized function. Inspections and maintenance shall be documented by the VCWPD and, if required, may be reported to regulatory agencies.[5]

Inspection criteria have been outlined in the manual to aid the inspector in determining if deviations from the design have occurred. Typical corrective measures are outlined in the manual, but the superintendent shall be responsible for determining the appropriate maintenance action to restore any damaged feature or deviated condition back to operable conditions and for assuring that the corrective maintenance is carried out. If the corrective action does not comply with the conditions set forth in the project permits or exceeds the original project footprint with either temporary or permanent impacts, additional authorization may be required prior to taking such maintenance actions.

Routine maintenance actions have also been outlined for each project element to ensure proper operation and longevity. Basic maintenance actions will include, but are not limited to, periodic concrete patching and repairs, debris and sediment removal and lubrication, adjustment, cleaning and painting of the flapgate and other metal parts.

In addition to operational maintenance of the flood control structures, the manual also outlines requirements for maintenance and operation of the access roads and fencing around the flood control structures. Steps to be taken in case of emergency are also outlined.

### *Environmental Best Management Practices*

All maintenance activities at the Fresno Canyon Flood Mitigation Project would occur in compliance with the appropriate Environmental Best Management Practices (BMPs) developed as part of the VCWPD's Operation, Maintenance, and Repair Manual.

The District has formally developed 25 environmental BMPs to reduce the environmental effects of its routine maintenance program (Program) for this and other flood control projects. The BMPs were developed with oversight of various regulatory agencies for the Program's Environmental Impact Report (EIR) and represent precautions and procedures to be used when planning and implementing maintenance activities that could affect sensitive environmental resources including wetlands, riparian habitat, aquatic habitat, threatened and endangered species, species of special concern, water quality, and hydraulic conditions in the watershed. The BMPs are designed to be feasible and practical. They will not curtail, reduce, or otherwise inhibit the District's maintenance requirements and activity guidelines. Implementation of the BMPs is standard practice for the maintenance crews. The following 21 BMPs were selected from the Program EIR with some additional clarification language added for this project. Full BMP descriptions are available in the manual.[6]

BMP 1 Avoid Channel Work during the Rainy Season

---

5 Ventura Watershed Protection District. Operation, Maintenance and Repair Manual; Fresno Canyon Flood Mitigation Project, Casitas Springs, Ventura County, California. Project No. 81182. April 2013 (Draft).

6 Ventura Watershed Protection District. Operation, Maintenance and Repair Manual; Fresno Canyon Flood Mitigation Project, Casitas Springs, Ventura County, California. Project No. 81182. April 2013 (Draft).

BMP 2 Prevent Discharge of Silt-Laden Water during Concrete Channel Cleaning

BMP 3 Location of Temporary Stockpiles

BMP 4 Survey for Habitat Prior to Routine Maintenance Work

BMP 5 Survey for Steelhead Migration Conditions and Sensitive Aquatic Species

BMP 6 Survey for Steelhead Rearing Habitat and Sensitive Aquatic Species

BMP 8 Avoid Disturbance to Native Beach or Wetland Species

BMP 9 Aquatic Pesticide BMPs

BMP 12 Leave Herbaceous Wetland Vegetation in Channel Bottom (Not Applicable in Concrete Box or Concrete Channel Sections)

BMP 13 Maximum 15-foot Vegetation-Free Zone at the Toe of the Bank

BMP 14 Avoid Road Base Discharge

BMP 15 Mitigate/Replace Temporary Impacts to Habitat

BMP 16 Oak Tree Mitigation Ratio

BMP 17 Concrete Wash-Out Protocols

BMP 18 Water Diversion Guide

BMP 20 Implementation of Integrated Pest Management Program

BMP 21 Avoid Spills and Leaks

BMP 22 Biological Surveys in Appropriate Habitat Prior to Vegetation Maintenance

BMP 23 Invasive Plant Removal Protocols

BMP 24 Air Quality BMPs

BMP 25 Construction Noise BMPs

# SECTION 3 ENVIRONMENTAL SETTING AND BIOTIC RESOURCES

This section describes the existing environmental setting of the proposed action area and defines the study methods used to evaluate the biological resources and potential impacts of the proposed action.

## 3.1 ENVIRONMENTAL SETTING

The project site is situated in unincorporated Ventura County, in the community of Casitas Springs, approximately 5 miles inland from the coast. It is located south of the Ojai Valley and surrounded by three mountain ranges. To the north the Nordhoff Ridge extends to approximately 5,000 feet above mean sea level (amsl). This ridge continues to the Topa Topa Bluff east of the Ojai Valley which stands 6,000 feet amsl. Sulphur Mountain bounds the Ojai Valley on the south at just under 3,000 feet amsl. Elevation at the site is approximately 280 feet amsl. Foster Park is adjacent and south of the site and Lake Casitas is approximately 1.3 miles to the northwest.

The action area and 100-foot buffer are surrounded by agricultural areas on the western side of the Ventura River and residential areas with ornamental trees on the eastern side as a section of the community of Casitas Springs. The surrounding hills are dominated by coastal sage scrub and oak woodlands. Soils on the site have been mapped by the Natural Resources Conservation Service (NRCS) as Diablo Clay, Mocho Loam, and Riverwash.[7]

The climate in the action area is Mediterranean and characterized by hot, dry summers and mild winters. As is typical for much of coastal Southern California, most precipitation falls in the form of rain between the months of October and April with intervening dry summers. The average temperatures in the summer months are in the upper 80 degrees Fahrenheit (°F) with lows in the mid-50s °F. Average temperatures in the winter months are in the high 60s °F with lows in the mid-30s °F. Rainfall averages 21 inches per year with between 2 and 5 inches per month falling between November and March.

## 3.2 METHODOLOGY

Impact Sciences biologist Dave Crawford conducted a field visit on September 21, 2012 of the action area. The purpose of the field visit was to characterize and evaluate the existing conditions and the potential of on-site habitats to support special-status plant or animal species and to inventory wildlife species present at the time of the survey. On October 11, 2012, Dr. Edith Read of E. Read and Associates visited the site to map existing vegetation associations and inventory plant species present within the action area.

Prior to the field visit, a search of the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB)[8] and California Native Plant Society (CNPS) database[9] was

7 NRCS, USGS Web Soil Survey. Available at http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm. 2012.

8 California Natural Diversity Database, Biogeographic Data Branch, Department of Fish and Game. July 2, 2012. Commercial Version, September 17, 2012.

9 California Native Plant Society Inventory of Rare and Endangered Plants. Advanced search of rare plants recorded by USGS 7.5-minute quadrangle map. http://www.rareplants.cnps.org/advanced.html. 2012.

conducted to identify special-status plant or wildlife species with a potential to occur in the vicinity of the action area. The CNDDB lists historical and recently recorded occurrences of special-status plant and animal species, and the CNPS database lists historical and recent occurrences of special-status plant species. The database searches included the Ventura, California US Geological Survey (USGS) 7.5-minute quadrangle, in which the action area is located, as well as the following six surrounding quadrangles: Matilija, Pitas Point, White Ledge Peak, Ojai, Saticoy, and Oxnard. **Appendices 3** and **4** provide details regarding the special-status plant and wildlife species, respectively, recorded from the region and their potential to occur in the action area.

The potential for special-status species to occur in the action area is based on the proximity of the action area to recorded occurrences from the CNDDB and CNPS databases, knowledge of the project region, on-site vegetation, habitat characteristics, topography, elevation, soils, surrounding land uses, and habitat preferences and geographic ranges of special-status plant and animal species known to occur in the region.

Additional references included:

- A review of federally listed species that may occur in the action area from the NMFS website,[10]
- The NMFS website to identify designated critical habitat for the Southern California steelhead Distinct Population Segment (DPS).[11]

In addition, to more fully understand the potential impacts to steelhead, Mr. Mark Allen of Normandeau Associates, Inc., prepared an evaluation of aquatic habitat in the Ventura River adjacent to the action area relative to steelhead use.[12] The Normandeau study is attached in its entirety as **Appendix 5**.

The aquatic habitat assessment included evaluation of fines (small particulates) in spawning gravels, substrate particle sizes on open cobble bars, delineation of the active channel and abundance of trout in pool habitats. Then utilizing the data collected an evaluation was done regarding potential project-related impacts to steelhead and their habitats.

## 3.3 VEGETATION COMMUNITIES

Vegetation observed on the Fresno Canyon project site is described below. Vegetation classifications generally follow Sawyer and Keeler-Wolf.[13] An illustration exhibiting the distribution of vegetation communities on the project site is provided in **Figure 4**. This figure also depicts the areas of both

10 National Marine Fisheries Service, Southwest Regional Office website. http://swr.nmfs.noaa.gov/psd/prd.htm 2012.

11 National Marine Fisheries Service, Southwest Regional Office website. http://swr.nmfs.noaa.gov/psd/stlesu.htm. 2012.

12 Normandeau Associates, Inc. Assessment of Pre-Project Aquatic Habitat in the Ventura River at the Fresno Canyon Confluence. October 25, 2012.

13 Sawyer and Keeler-Wolf. *A Manual of California Vegetation. 2nd ed. California Native Plant Society. Sacramento, California.* 2009.

permanent and temporary impacts. A list of all plant species observed at the time of the survey is included as **Appendix 2**.

### 3.3.1 Riparian Scrub

Riparian scrub is dominated by arroyo willow (*Salix lasiolepis*), with mule fat (*Baccharis salicifolia*) common in the understory. This community occurs at the eastern end of the action area in lower Fresno Canyon, but is most common in the Ventura River, where Fremont cottonwood (*Populus fremontii*) is also present but not dominant. Much of this community in the river is infested with giant reed (*Arundo donax*), a non-native perennial weed.

### 3.3.2 Oak-Walnut Woodland

Coast live oak (*Quercus agrifolia*) and California black walnut (*Juglans californica*) co-occur in large stands in the survey area, occurring on hills as well as along roads and easements.

### 3.3.3 Annual Grassland

Annual grassland occurs in open fields and as understory in the oak-walnut woodland and ornamentals/naturalized exotics communities. Dominant species are not native to California. These species include wild oat (*Avena* sp.), brome (*Bromus* spp.), and a large stand of fennel (*Foeniculum vulgare*) at the eastern end of the action area.

### 3.3.4 Venturan Sage Scrub (= *Artemisia californica* [California Sagebrush] scrub alliance)

Venturan sage scrub occurs on a hill in the southwest part of the survey area. Common species include California sagebrush (*Artemisia californica*), buckwheat (*Eriogonum fasciculatum*), coyote brush (*Baccharis pilularis*), purple sage (*Salvia leucophylla*), and toyon (H*eteromeles arbutifolia*).

### 3.3.5 Ceanothus Alliance

A small stand of California lilac (*Ceanothus* spp.) occurs along the recreational trail adjacent to the Ventura River. These species were not observed anywhere else in the action area and may have been planted.

### 3.3.6 Individual Trees

Individual trees, all native except for blue gum (*Eucalyptus* sp.), occur throughout the survey area, not forming a definite vegetation community. Native species include coast live oak, California black walnut, sycamore (*Platanus racemosa*), black elderberry (*Sambucus nigra*), and arroyo willow. A formal evaluation of native tree impacts will be prepared under separate cover.

### 3.3.7 Ornamentals and Naturalized Exotics

Perennial, woody non-native trees and groundcover occur in scattered stands along roads and trails, and on a terraced retaining wall at the southern end of Edison Road. Most of these species also occur in landscaping within developed areas, but appear to be surviving without irrigation or management, other than pruning. Species include Peruvian pepper (*Schinus molle*), periwinkle (*Vinca major*), Himalayan blackberry (*Rubus armeniacus*), and blue gum (*Eucalyptus* sp.).

## 3.4 FEDERALLY LISTED SPECIES

In September 2009, a request for Section 7 consultation was submitted to the US Fish and Wildlife Service (USFWS). Following consultation, in January 2010 the USFWS issued a Biological Opinion (BO) relative to proposed action impacts to the following:

- California red-legged frog (*Rana draytonii*)
- least Bell's vireo (*Vireo bellii pusillus*)
- southwestern willow flycatcher (*Empidonax traillii extimus*).

The BO authorized the project to proceed with numerous conditions including limited seasonal timing of activities and required pre-activity surveys by a qualified biologist authorized by the USFWS. The BO, in its entirety, is included in this document as **Appendix 6**.

Based on the field survey and review of the above sources, FEMA determined that the Southern California steelhead (*Oncorhynchus mykiss*) Distinct Population Segment (DPS) is the only federally listed (or proposed for federal listing) species with the potential to occur in the vicinity of the action area and regulated by NMFS under the federal Endangered Species Act.

### 3.4.1 Southern California Steelhead DPS

#### *Life History*

Steelhead (*Oncorhynchus mykiss*) have been divided into Distinct Population Segments (DPSs). The Southern California steelhead DPS was listed as endangered under the ESA on August 18, 1997, and reaffirmed on January 5, 2006.[14] The DPS for the Southern California steelhead includes all naturally spawned anadromous steelhead populations below natural and human made, impassable barriers in streams from the Santa Maria River, San Luis Obispo County, California (inclusive), to the US-Mexico Border.[15]

---

14 NMFS (National Marine Fisheries Service). *Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead; Final Rule.* January 5, 2006.

15 NMFS. *Southern California Steelhead DPS: Endangered.* Available at http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populaltions/Steelhead/STSCA.cfm. 2009.

Steelhead are rainbow trout with an anadromous life history. Steelhead make spawning runs into rivers and small creeks flowing into the ocean. In general, adult steelhead return to rivers and creeks in the region from January to April. Spawning takes place in the rivers from January to May with most spawning activity occurring between January and March. These dates are regulated by rainfall levels and storm events. Although juvenile steelhead can spend up to seven years in freshwater before moving downstream as smolts,[16] most steelhead remain in freshwater for one to four years before they out-migrate into the open ocean during spring and early summer.[17] Steelhead can spend up to three years in saltwater before returning to freshwater to spawn.[18] Since juvenile steelhead remain in the creeks year-round, adequate flows, suitable water temperatures, and an abundant food supply are necessary throughout the year in order to sustain steelhead populations. The most critical period is the summer and early fall when these conditions become limiting.

Steelhead prefer main channels as opposed to small tributaries. The migration season for steelhead extends from late December through April, although they often move up coastal streams in the fall and then hold in deep pools until the spawning period.[19] Migrating fish require deep holding pools (deeper than 9 feet) with cover such as underwater ledges and caverns.[20] Coarse gravel beds in riffle areas are used for egg laying and yolk sac fry habitat once eggs have hatched.

Potential spawning areas require gravel bottoms and specific water conditions. Spawning habitat condition is strongly affected by water flow and quality, especially temperature, dissolved oxygen, and silt load, all of which can greatly affect the survival of eggs and larvae.[21] Migratory corridors start downstream of the spawning areas and allow the upstream passage of adults and the downstream emigration of out-migrant juveniles. Migratory habitat condition is strongly affected by the presence of barriers, which can include dams, culverts, flood-control structures, unscreened or poorly screened diversions, and degraded water quality.[22]

Both spawning areas and migratory corridors compose rearing habitat for juveniles, which feed and grow before and during their out-migration. Non-natal, intermittent tributaries also may be used for juvenile rearing. Rearing habitat condition and function may be affected by annual and seasonal flow and temperature characteristics. Specifically, the lower reaches of streams often become less suitable for

16 Busby, P.J., T.C. Wainwright, G.J. Bryant, L.J. Lierheimer, R.S. Waples, F.W. Waknitz, and I.V. Lagomarsino. *Status Review of West Coast Steelhead from Washington, Oregon, and California*. National Oceanic and Atmospheric Administration Technical Memorandum. NMFS-NWFSC-27. 1996.

17 Goals Project. *Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish, and Wildlife.* Prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. P.R. Olofson, editor. San Francisco Bay Regional Water Quality Control Board, Oakland, CA. 2000.

18 Barnhardt, R.A. Species Profiles: *Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (Pacific Southwest) Steelhead.* US Fish and Wildlife Service Biological Report 82. (11.60), 21 pp. 1986.

19 McGinnis, S. *Freshwater Fishes of California*. Berkeley: University of California Press, 1984.

20 CDFG (California Department of Fish and Game). *Fish Species of Special Concern in California, Second Edition*. 1995.

21 USFWS (US Fish and Wildlife Service). *Formal Section 7 Consultation on the Santa Fe Partners Concord to Sacramento Pipeline Project Contra Costa, Solano, and Yolo Counties, California, Permit Number 26449S*. 2004.

22 USFWS (US Fish and Wildlife Service). *Formal Section 7 Consultation on the Santa Fe Partners Concord to Sacramento Pipeline Project Contra Costa, Solano, and Yolo Counties, California, Permit Number 26449S*. 2004.

juvenile rearing during the summer. Rearing habitat condition is strongly affected by habitat complexity, food supply, or presence of predators of juvenile salmonids.[23]

Steelhead require cool, clean, well-oxygenated water and appropriate gravel for spawning. The preferred water depth for spawning ranges from about 6 to 24 inches with an optimum around 14 inches. Steelhead spawn using gravel about 0.25 to 5.0 inches in diameter. To some extent, the size of gravel that can be used depends on the size of the spawning fish. Spawning and incubation gravels should contain less than 5 percent sand and silt to ensure high permeability and oxygen content. Although southern steelhead prefer mostly gravel-sized material for spawning, they also use mixtures of sand and gravel, or gravel and cobble. Steelhead may spawn in intermittent streams, but juveniles move into perennial streams soon after hatching. Steelhead are generally located where water temperatures range from 50 to 59 °F with an upper sustainable temperature of 68 °F. Southern steelhead have adapted to be more tolerant of the higher range. Steelhead are iteroparous; that is, an individual may survive spawning, return to the ocean, and ascend streams to spawn again. However, it is unusual for steelhead to spawn more than twice, and it is usually the females that survive to spawn again.

Anadromous steelhead have two basic life histories: stream maturing (enter freshwater with immature gonads) and ocean maturing (enter freshwater with mature gonads). Stream-maturing steelhead, also called summer steelhead, typically enter freshwater in the spring, early summer, or possibly fall. These fish move up to the headwaters of streams, hold and mature in deep pools, and spawn in late fall and winter.

Spawning occurs in waters with velocities from 1 foot per second (ft/s) to 3.6 ft/s with an optimum around 2 ft/s. Larger steelhead can spawn at higher stream velocities. Spawning migrations may be hindered by water velocities of 10 to 13 ft/s.

Juvenile steelhead hatch in 19 to 80 days depending on the water temperature. Gravel emergence occurs about two to three weeks after hatching. Fry often school and occupy quiet water along the banks of a stream. Back eddies, large woody debris, undercut banks, and undercut tree roots supply good fry habitat. Secondary channel pools with good cover are often used. As the fish grow, they occupy individual territories and move to deeper and swifter water with coarser habitat. Most juvenile steelhead occupy riffles. Some of the larger fish may occupy runs or pools, particularly in the absence of Coho salmon. Fry require water 2 to 14 inches deep, with an optimum around 8 inches. Parr use water from 10 to 20 inches deep with an optimum of 10 inches. Fry and juvenile steelhead prefer a cobble/rubble sized substrate material, which is slightly larger than that preferred for spawning. Large boulder substrate is important in runs and riffles. Surface turbulence and whitewater are used for overhead cover by juvenile steelhead. Summer rearing habitat with cool water pools and extensive cover for older juvenile steelhead are often limiting on California streams. Juvenile steelhead may migrate upstream or downstream to find suitable habitat.

Juvenile steelhead are opportunistic drift feeders. While in freshwater, steelhead subsist on aquatic invertebrates and terrestrial invertebrates that fall into the water. Larger steelhead are piscivorous (fish-eating).

---

23 USFWS (US Fish and Wildlife Service). *Formal Section 7 Consultation on the Santa Fe Partners Concord to Sacramento Pipeline Project Contra Costa, Solano, and Yolo Counties, California, Permit Number 26449S*. 2004.

### *Potential to Occur*

The Normandeau study revealed the presence of rainbow trout both up and downstream of the Fresno Canyon outfall. The study also identified numerous spawning beds (redds) in these areas. Though there is no accurate way to determine visually if a rainbow trout is a resident or an anadromous steelhead, the sizes of fish observed indicate the majority of fish observed were likely resident freshwater trout. However, there were also indications that some of the fish observed may have been the anadromous steelhead.

### *Designated Critical Habitat*

On September 2, 2005, NMFS issued a final rule designating critical habitat for the Southern California steelhead DPS, which includes the Ventura River (70 CFR 5230).[24]. Suitable habitat for Southern California steelhead DPS exists within the Ventura River channel and associated riparian habitat within the action area. Additionally, the action area is within the Ventura River Hydrologic Unit (4402) identified as designated critical habitat for the Southern California steelhead (NMFS 2005).

The primary constituent elements for the Southern California steelhead designated critical habitat are (NMFS 2005):

- Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development. These features are essential to conservation because, without them, the species cannot successfully spawn and produce offspring.

- Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks. These features are essential to conservation because, without them, juveniles cannot access and use the areas needed to forage, grow, and develop behaviors (e.g., predator avoidance, competition) that help ensure their survival.

- Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival. These features are essential to conservation because, without them, juveniles cannot use the variety of habitats that allow them to avoid high flows, avoid predators, and successfully immigrate to the ocean. Similarly, these features are important for adults because they allow fish in a non-feeding condition to successfully swim upstream, avoid predators, and reach spawning areas on limited energy stores.

- Estuarine areas free of obstruction with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- saltwater; natural cover such as submerged and overhanging large wood, aquatic and vegetation, large rocks and boulders, and

24 NMFS (National Marine Fisheries Service). *Endangered and Threatened Species; Designation of Critical Habitat for 7 Evolutionary Significant Units of Pacific Salmon and Steelhead in California; Final Rule*. September 2. 2005.

side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth, and maturation. These features are essential to conservation because, without them, juveniles cannot reach the ocean in a timely manner and use the variety of habitats that allow them to avoid predators and compete successfully in the ocean. Similarly, these features are important to adults because they provide a final source of abundant forage that will provide them the energy stores needed to make the physiological transition to fresh water, migrate upstream, avoid predators, and develop to maturity upon reaching the spawning areas.

- Nearshore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels. As in the case with freshwater migration corridors and estuarine areas, nearshore marine features are essential to conservation because, without them, juveniles cannot successfully transition from natal streams to offshore marine areas.

- Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation. These features are essential for conservation because, without them, juveniles cannot forage and grow to adulthood.

# SECTION 4 ADVERSE EFFECTS AND AVOIDANCE AND MINIMIZATION MEASURES

The following subsections provide information regarding project related potential adverse effects on special-status resources and recommendations to minimize those effects.

## 4.1 POTENTIAL ADVERSE EFFECTS TO NON-CRITICAL HABITAT VEGETATION

The proposed action will result in potential adverse effects to vegetation communities not directly associated with designated critical habitat for steelhead. These effects are as follows:

Oak-Walnut Woodland

| | |
|---|---|
| Temporary Impacts: | 0.24 acre |
| Permanent Impacts: | 0.23 acre |

Annual Grassland

| | |
|---|---|
| Temporary Impacts: | 0.00 acre |
| Permanent Impacts: | 0.01 acre |

Venturan Sage Scrub (= *Artemisia californica* [California Sagebrush] scrub alliance)

| | |
|---|---|
| Temporary Impacts: | 0.03 acre |
| Permanent Impacts: | 0.02 acre |

Ceanothus Alliance

| | |
|---|---|
| Temporary Impacts: | 0.00 acre |
| Permanent Impacts: | 0.04 acre |

Unavoidable permanent effects to non-critical habitat vegetation totals 0.30 acre. As these effects do not include critical habitat and because of the small area being affected, the proposed action is not likely to adversely affect the Southern California steelhead trout DPS.

## 4.2 POTENTIAL ADVERSE EFFECTS TO THE STEELHEAD

The following subsections describe the potential adverse effects on the Southern California steelhead, which is the only special-status resource under NMFS jurisdiction that is considered to be potentially affected by the proposed action.

### 4.2.1 Take and Disturbance

Because of the proximity of the action area to the Ventura River and its associated riparian zone, the proposed action has the potential to adversely affect individuals of the Southern California steelhead DPS during project construction without the implementation of avoidance and minimization measures. The

main stem of the Ventura River between the San Antonio Creek confluence and Foster Park is historically known for being productive rearing habitat for juvenile *O. mykiss*, which has been recently confirmed by ongoing steelhead distribution and abundance studies.[25]

Without implementation of avoidance and minimization measures, the proposed action could potentially result in the take of steelhead individuals through direct injury or mortality of juvenile fish or indirectly affect individuals by temporarily degrading habitat quality during project construction. Fish may be killed or trapped by materials that accidentally fall into the water. Accidental spills of hazardous materials during project construction could injure or kill members of these species. Additionally, a potential threat may be the recruitment of fine sediments into the main stem of the Ventura River. The Normandeau study stated "The density of spawning gravel and *O. mykiss* redds within the low-flow channel downstream of the Fresno Canyon confluence may represent the highest density of gravel and spawning activity in any reach in the mainstem Ventura River."[26]

Other potential impacts include "capture" of the low flow channel along the rip-rap bank protection and alteration of the large pool adjacent to the proposed outlet.

The proposed action includes the installation of a flapgate at the western end of the existing flood-control channel to protect against backflow from the Ventura River. The flapgate would prevent fish from gaining access to the existing concrete channel and the replaced local drainage outlet connecting the Ventura River to Fresno Canyon east of SR 33. Therefore, take at this location would not be expected to result from project operation during high floods.

As discussed in **Section 4.3**, avoidance and minimization measures would be in place to prevent and/or reduce the potential of incidental take of this species.

### 4.2.2 Erosion and Sedimentation

The following two subsections discuss erosion and sedimentation effects during project construction and project operation.

#### *Project Construction*

Steelhead could be indirectly affected by increased erosion and sedimentation during project construction, as a result of potential temporary effects to water quality.

Sedimentation could result in the loss of deep, cool water pools, potentially reducing the amount of available habitat near the proposed outlet in the Ventura River bank that juvenile and adult salmonids use for shelter and forage. Sediment can also smother the aquatic invertebrates that juvenile salmonids feed on or cement the substrate so that spawning cannot take place.

---

25 Normandeau Associates, Inc. Assessment of Pre-Project Aquatic Habitat in the Ventura River at the Fresno Canyon Confluence. October 25, 2012.

26 Normandeau Associates, Inc. Assessment of Pre-Project Aquatic Habitat in the Ventura River at the Fresno Canyon Confluence. October 25, 2012.

Implementation of the avoidance and minimization measures described in **Section 4.4** would help minimize potential adverse effects to steelhead habitat.

### *Project Operation*

During project operation, the total sediment load discharged into the Ventura River would be discountable during large storm events compared to existing conditions. Under existing conditions during large storm events, sediment sometimes settles in the concrete portion of the existing channel, decreasing its capacity to convey flow and resulting in flooding. The sediment is mechanically removed from the existing channel at Fresno Canyon Creek and disposed of. The proposed action is designed so that the sediment entering the culvert at the base of Fresno Canyon would be conveyed to the outlet of the channel at the Ventura River. To the extent that sediment does not settle in the new channel and does not need to be mechanically removed, there would be a minor increase in sediment discharging into the Ventura River. Only the largest debris would be trapped by a trash rack upstream of the proposed box culvert. During high flows in the Ventura River, flows may backwater into the proposed channel, and some sediment may settle out at the end of the channel just before entering the Ventura River. This sediment would be removed. Even though the total load of sediment discharged during project operation may increase slightly, there would likely be less sediment discharged to the Ventura River at the existing outlet from Fresno Canyon. After construction of the proposed action, the existing channel would be used primarily to convey local drainage because the flows from Fresno Canyon would be directed along the proposed bypass route.

The minor increase in sediment load from Fresno Canyon would only occur during storm events and would not be expected to significantly affect sediment concentrations in the Ventura River. The Ventura River conveys much larger sediment loads during large storm events compared to Fresno Canyon. The upper watershed of the river also contains steep slopes and erodible soils that contribute a large amount of sediment to the river. Even though the sediment loads have not been quantified, they are correlated with the stream flows. The peak flows in the river at Casitas Springs were determined to be 35,200 cubic feet per second (cfs), 56,600 cfs, and 66,600 cfs for the 10-year, 50-year, and 100-year floods, respectively.[27] The peak flows in Fresno Canyon at the confluence with the Ventura River for the same recurrence intervals were respectively determined to be 830 cfs, 1,240 cfs, and 1,450 cfs.[28] The peak flows in Fresno Canyon are less than 2.5 percent of the peak flows in the Ventura River. Even though the peak flows on both flooding sources are not likely to occur at exactly the same time, the flow from Fresno Canyon is not expected to significantly affect the flow or sediment concentration in the Ventura River. If a large storm occurred in Fresno Canyon (e.g., a large thunderstorm) when flows were small in the Ventura River, any sediment discharged to the river would quickly settle out near the mouth of the proposed Fresno Canyon bypass route. Any increases in suspended sediment concentration would only last for the duration of the storm and would not increase the concentration in Ventura River beyond the normal variability.

---

[27] Tetra Tech. 2009. *Baseline Model Calibration and Validation Report, Ventura River Watershed Hydrology Model*. Prepared for Ventura County Watershed Protection District, Ventura, CA. February 12.

[28] Hawks & Associates. *Fresno Canyon Flood Mitigation Pre-Design Study Final Report.* Prepared for Ventura County Watershed Protection District, Ventura, CA. August 2007.

Given that project operation would not significantly increase suspended sediment concentrations in the Ventura River, adverse effects on adult and juvenile steelhead from erosion and sedimentation would be expected to be less than significant. Adult steelhead are known to migrate in the Ventura River during high flows typically occurring from October through April, at which time sediment loads during large storm events are already high in the river. Most juvenile steelhead remain in freshwater for one to four years before they out-migrate into the open ocean. The resident juvenile steelhead would not be affected during the dry season because it is unlikely that Fresno Canyon would be discharging during this time of the year, and during the winter, the total sediment load discharged into the Ventura River should be at a level that would not significantly affect the spawning areas downstream. However, the Normandeau study would not make this conclusion based on their study results as only one year of data was collected.

## 4.3 ADVERSE EFFECTS ON CRITICAL HABITAT

The Normandeau study indicated "the abundance of suitable spawning gravel, *O. mykiss* redds, and large adult *O. mykiss* in the mainstem Ventura River immediately below the proposed location of the new Fresno Canyon outlet illustrates the importance of this reach in supporting the Southern California steelhead DPS and its associated critical habitat."[29]

The part of the proposed action that would directly and adversely affect critical habitat for this species is the construction of the outlet and removal of riparian vegetation at the outlet location. The potential adverse effects associated with the removal of riparian vegetation include the reduction of vegetation that provides cover and shade for aquatic species, the introduction of sediment into the waterway from erosion or runoff, and the loss of suitable gravel substrate through burial by sediment.

A minor amount of designated critical habitat for Southern California steelhead (approximately 0.34 acre Riparian Scrub) would be permanently removed as a result of the proposed action. Habitat components, such as riparian vegetation, important to the conservation of these species would be affected by the proposed action. The riparian zone functions are an essential feature of critical habitat for steelhead. The removal of riparian vegetation could result in higher stream temperatures through loss of shade from the loss of natural bank stabilization. As discussed in **Section 4.4**, avoidance and minimization measures would be in place to prevent or reduce adverse effects to designated critical habitat.

## 4.4 AVOIDANCE AND MINIMIZATION MEASURES FOR STEELHEAD

The VCWPD has agreed to implement the following measures to avoid and minimize potential adverse effects to the Southern California steelhead DPS and designated critical habitat.

### 4.4.1 Proposed Action Timing

To reduce the adverse effects to the Southern California steelhead DPS during their migration and spawning season, the VCWPD shall perform all outlet construction activities outside the migration period. Typically, construction activities would take place between June 15 and October 15. However, because the river may also provide habitat to support federally listed species under USFWS jurisdiction,

[29] Normandeau Associates, Inc. Assessment of Pre-Project Aquatic Habitat in the Ventura River at the Fresno Canyon Confluence. October 25, 2012.

the work window has been modified to between August 31 and October 31. Work upstream of the proposed outlet would occur throughout the year, depending on nesting bird survey results.

### 4.4.2 Take Avoidance Measures

VCWPD shall implement the following measures to avoid and/or minimize the potential for take of steelhead:

- Exclusion fences composed of silt fence material shall be installed at the margins of the work area to prevent workers or construction materials from encroaching into adjacent habitat and to prevent materials from entering the waters of Ventura River. The fence shall be monitored periodically for integrity and effectiveness. The fencing shall be maintained for the duration of construction and removed upon project completion.

- A NMFS-approved biologist shall monitor construction activities that involve work within the Ventura River, dewatering activities, and installation of the outlet structure for the purpose of identifying and reconciling any condition that could adversely affect listed salmonids or their habitat.

- Preconstruction surveys shall include the collection and relocation of fish, if necessary, by an NMFS-approved fisheries biologist from the construction site prior to and during dewatering. The NMFS-approved fisheries biologist shall be familiar with the life history and identification of steelhead.

- All captured fish shall be held in well-oxygenated water with temperatures equivalent to ambient in stream temperatures. Once recovered, they shall be placed in suitable habitat (in stream cover and pools deeper than 1 foot) downstream of the action area.

- If any steelhead individuals are found dead or injured, the biologist shall immediately contact the NMFS Long Beach Field Office to review the activities that resulted in the take and determine whether additional protective measures are required.

### 4.4.3 Erosion, Sedimentation, Spill, and Pollution Control

VCWPD shall implement the following measures to prevent erosion, sedimentation, potential spills, and pollution:

- Disturbance to existing grades and vegetation shall be limited to the actual site of the project and necessary access routes. Placement of all roads, staging areas, and other facilities shall be carried out so as to avoid and limit disturbance to stream bank or stream channel habitat to the extent possible.

- Erosion-control and sediment-detention devices (e.g., well-anchored sandbag cofferdams, straw bales, silt fences) shall be incorporated into the project design and implemented at the time of construction. These devices shall be in place during construction activities, and after if necessary, to minimize fine sediment and sediment/water slurry input to flowing water and to detain sediment-laden water on-site. These devices shall be placed at all locations where the likelihood of sediment input exists. Supply of erosion control materials shall be available to cover small sites that may become bare and to respond to sediment emergencies.

- The VCWPD shall inspect the performance of sediment-control devices at least once each day during construction to ensure that the devices are functioning properly. If a control measure is not functioning properly, the control measure shall be repaired immediately or replaced. Additional controls shall be installed as necessary.

- Sediment shall be removed from sediment controls once the sediment has reached one-third of the exposed height of the control. Sediment collected in these devices shall be disposed of at approved disposal sites away from the collection site.

- All disturbed soils at each site shall undergo erosion-control treatment during construction and after construction is terminated. Treatment may include temporary seeding and sterile straw mulch or other effective measures. Any disturbed soils on a gradient of over 30 percent shall have erosion-control blankets or similar effective measures put in place.

- Any stockpiles of soil used for fill material during construction shall be covered with a tarp or erosion-control blanket, and silt fences shall be installed appropriately to contain soils from moving into area waterways. If the local weather forecast indicates a greater than a 50-percent chance of rain, the project site shall be "rain-proofed" with erosion-control measures so that no sediment or turbidity enters the stream.

- All debris, sediment, rubbish, vegetation, or other material removed from the channel banks, channel bottom, or sediment basins shall be disposed of at an approved disposal site. All petroleum product chemicals, silt, fine soils, and any substance or material deleterious to listed species shall not be allowed to pass into, or be placed where it can pass into, the stream channel. There shall be no sidecasting of material into any waterway.

- The VCWPD shall exercise every reasonable precaution to protect the Ventura River from pollution with fuels, oils, bitumens, calcium chloride, and other harmful materials.

- Construction byproducts and pollutants such as petroleum products, chemicals, fresh cement, or deleterious materials shall not be allowed to discharge into the Ventura River and shall be collected and transported to an authorized disposal area.

- A plan for the emergency cleanup of any spills of fuel or other material shall be prepared and kept available on-site during construction activities.

- Equipment shall be refueled and serviced at designated construction staging areas. All construction material and fill shall be stored and contained in a designated area that is located away from channel areas to prevent transport of materials into adjacent streams. A silt fence shall be installed to collect any discharge, and adequate materials for spill cleanup shall be maintained on-site.

- Construction vehicles and equipment shall be maintained to prevent contamination of soil or water (from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease).

- Good housekeeping practices, use of safer alternative products, such as biodegradable hydraulic fluids, shall be used when feasible.

- An employee training program shall be implemented. Employees shall be trained to prevent or reduce the discharge of pollutants from construction activities to waters and of the appropriate measures to take if a spill occurs.

- In the event of a spill, work shall be stopped immediately, spill control shall be implemented, and NMFS shall be notified.

### 4.4.4 Minimization of Adverse Impacts on Critical Habitat

VCWPD shall implement the following measures to protect steelhead critical habitat:

- Disturbance to existing grades and vegetation shall be limited to the actual site of the project and necessary access routes. When possible, existing and proposed ingress or egress points shall be used and the contours of the action area shall be returned to pre-construction condition or better.

- The VCWPD shall, to the maximum extent practicable, reduce the amount of disturbance on-site to the absolute minimum necessary to accomplish the proposed action.

- Whenever practicable, existing vegetation shall be salvaged from the footprint of the action area and stored for replanting after earthmoving activities have been completed.

- Because a relatively small amount of riparian vegetation (i.e., 0.34 acre) shall be permanently lost at the outlet location during project construction, the VCWPD shall restore the temporary impact area at a 1:1 ratio through planting willows and other riparian species. For permanent impacts, mitigation shall be implemented at a 3:1 ratio followed by a five-year monitoring period to reach an 80 percent success criterion. This is consistent with CDFW standard mitigation requirements for impacts to riparian habitats. Mitigation for permanent impacts may include exotic plant removal and riparian species revegetation, depending on the selected location.

- The VCWPD shall take measures to prevent the introduction of invasive weeds at the construction site. The measure shall include cleaning all equipment before bringing it on-site and using only certified weed-free erosion-control and revegetation materials.

## 4.5 SUMMARY OF POTENTIAL ADVERSE IMPACTS ON STEELHEAD

The implementation of the measures described in **Section 4.4**, will reduce the likelihood of effects (take), however, the project is not likely to jeopardize the existence of the California steelhead DPS in the Ventura River. However, because juvenile steelhead may occur at the Ventura River year-round, the proposed action may affect some juveniles, and they may need to be excluded from the action area before construction of the proposed outlet, but impacts to this small area would not affect the ability of the species to persist in the Ventura River. Therefore, the proposed action is not likely to adversely affect the Southern California steelhead DPS.

## 4.6 SUMMARY OF POTENTIAL ADVERSE IMPACTS ON CRITICAL HABITAT

A small amount of riparian vegetation (i.e., 0.34 acre) would be permanently lost at the outlet location because of project construction, but would be mitigated at a suitable location along the Ventura River as

close to the affected area as feasible and appropriate. Avoidance and minimization measures identified in **Section 4.4,** including the planting of riparian vegetation, would be implemented to minimize adverse direct impacts to Southern California steelhead DPS designated critical habitat. Therefore, FEMA has determined that the proposed action will not adversely affect steelhead migrating through the Ventura River migration corridor and will not adversely affect critical habitat for the Southern California steelhead DPS.

# SECTION 5 CUMULATIVE ADVERSE EFFECTS

Cumulative effects as defined in the ESA are the effects of future state or private activities that are reasonably certain to occur within the proposed action area (50 CFR Section 402.14[g][4]). Most often, the potential for cumulative effects is escalated when multiple projects occur within the same watercourse, in the same habitat type, in close proximity to each other, or are somehow otherwise determined to be connected in some manner. Cumulative effects on the species that are federally listed or proposed for listing and addressed in this report need to be analyzed in association with other projects near the Ventura River that would affect the riparian or in-stream habitat of the river. No other future state or private projects along the Ventura River in the vicinity of the action area have been identified, as of the time this report was prepared.

Cumulative effects could be the result of the net loss of riparian habitat and/or runoff of sediments, nutrients, and pollutants into the Ventura River. Potential adverse effects on fish and/or habitat resulting from the proposed action would be minor individually.

The proposed action is not expected to have an overall cumulative effect on the Southern California steelhead DPS or its critical habitat. The expected disturbance of riparian habitat from the proposed action would be a small area (approximately 0.34 acre), and mitigation would occur at a suitable site along the Ventura River, as close as feasible to the affected area, after completion of the proposed action. The hydrology of the Ventura River would not be altered as a result of the proposed action. Therefore, the proposed action would not have any long-term adverse cumulative effects on the Southern California steelhead DPS or its designated critical habitat.

# SECTION 6 LIST OF PREPARERS

**FEMA Region IX**
Alessandro Amaglio, Regional Environmental Officer
A. Gilda Barboza, Environmental Protection Specialist

**Impact Sciences, Inc.**
Dave Crawford, Managing Principal, Biological Services

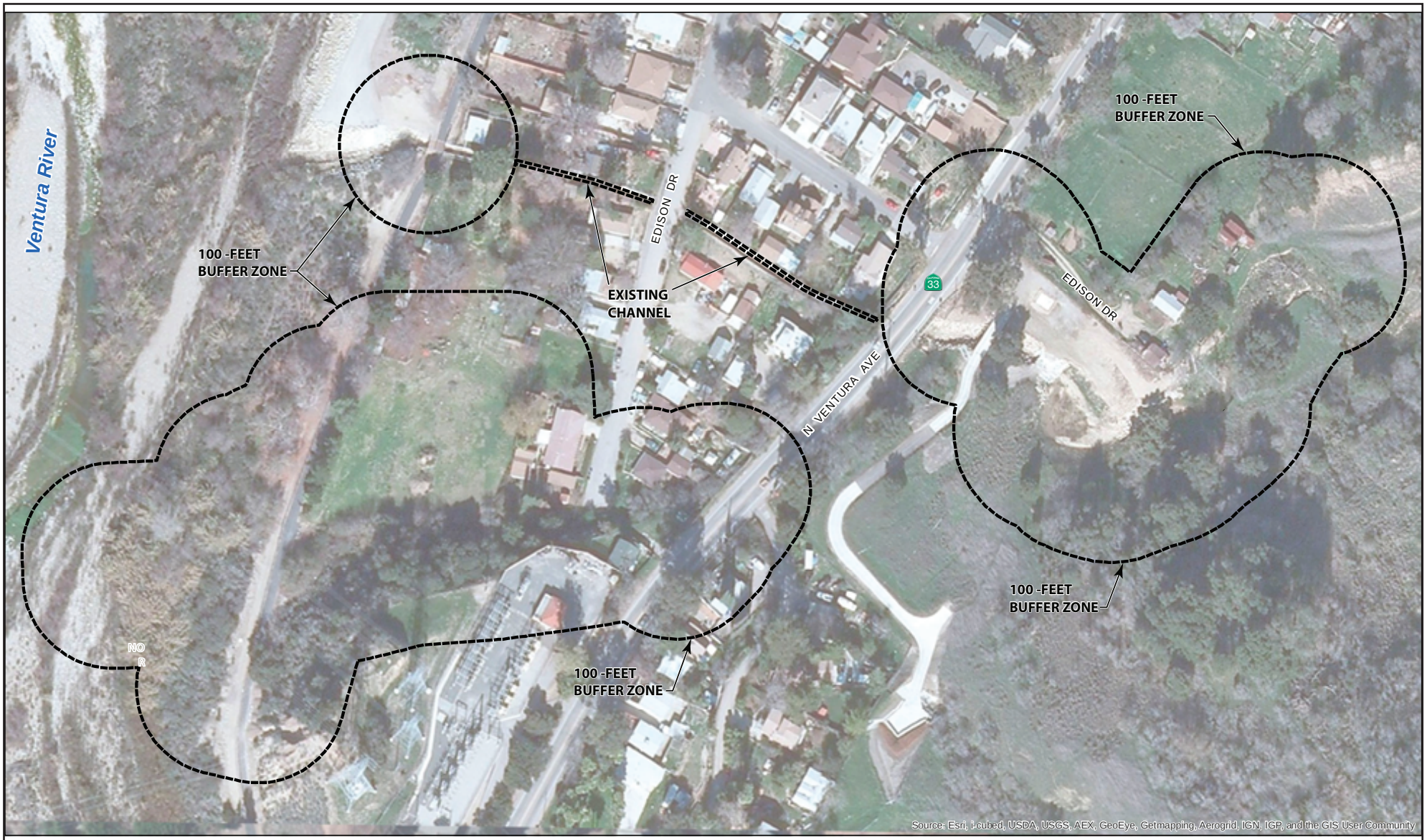
**Normandeau Associates, Inc.**
Mark Allen, Fishery Biologist


**SOURCE:** USGS, 2012

FIGURE **1**

Project Vicinity

1137.001•11/12

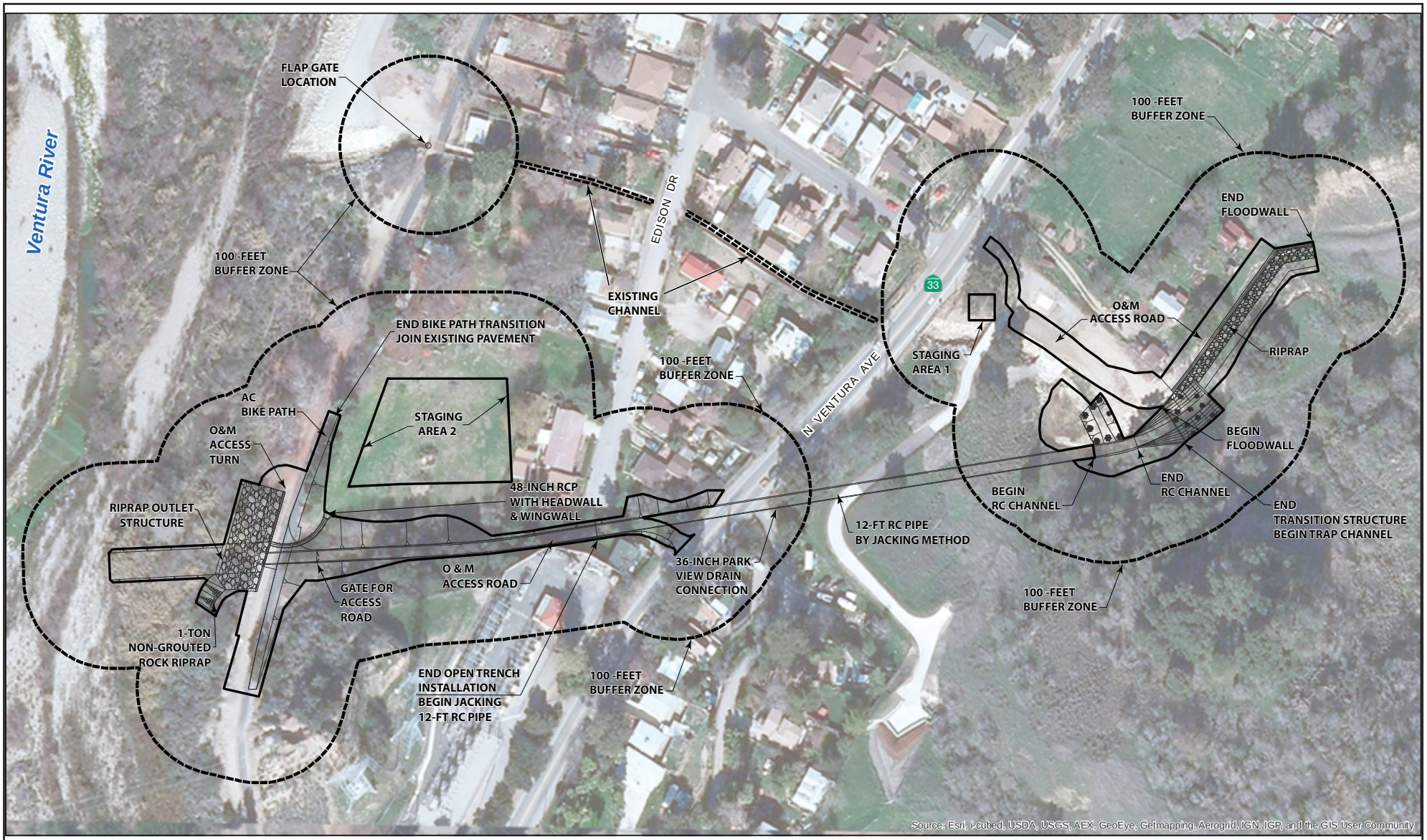



**SOURCE:** Impact Sciences, Inc., April 2013

FIGURE **2**

Action Area

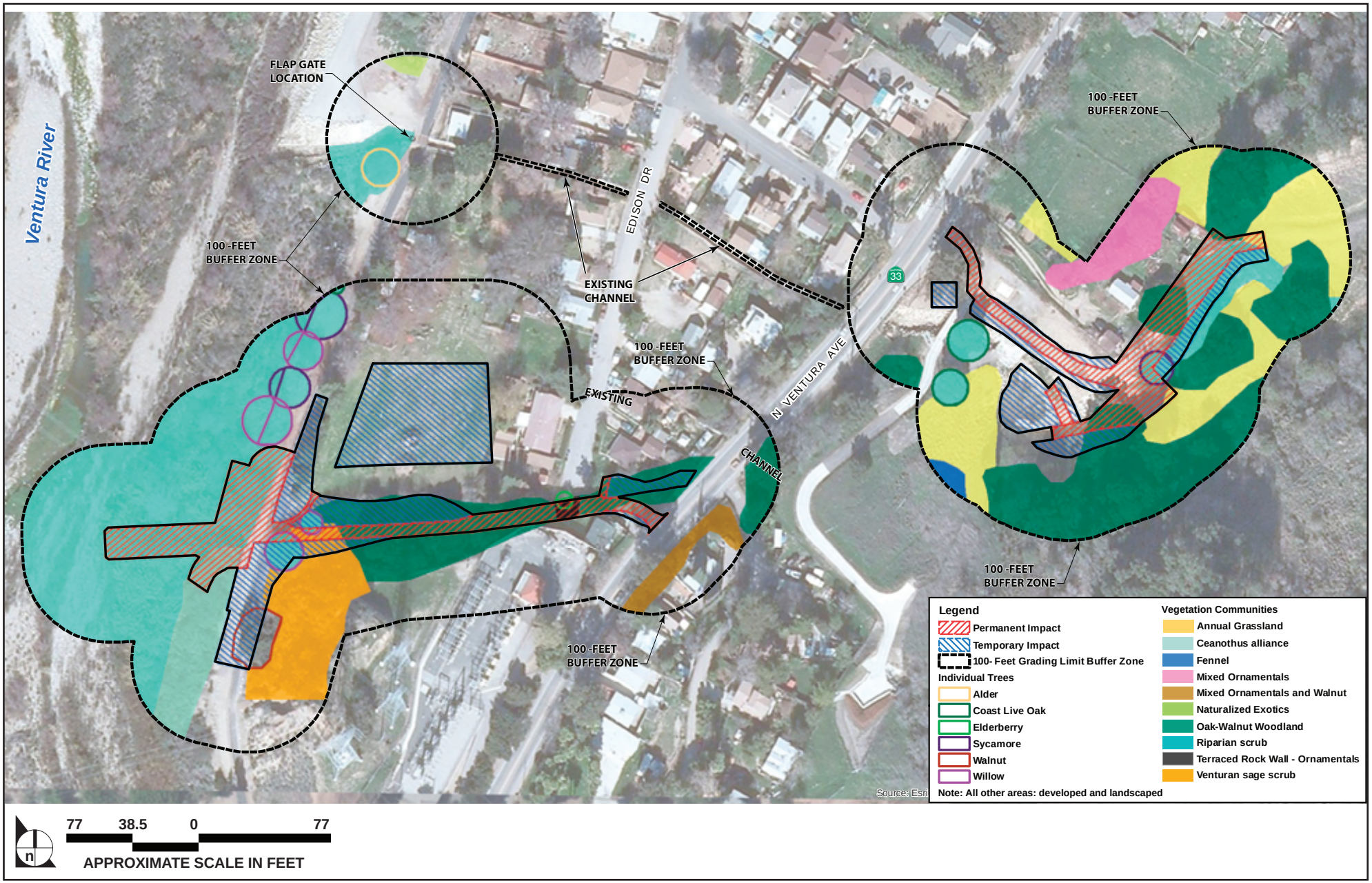
1137.001.001•04/13




**SOURCE:** Impact Sciences, Inc., April 2013

FIGURE **3**

# Proposed Action



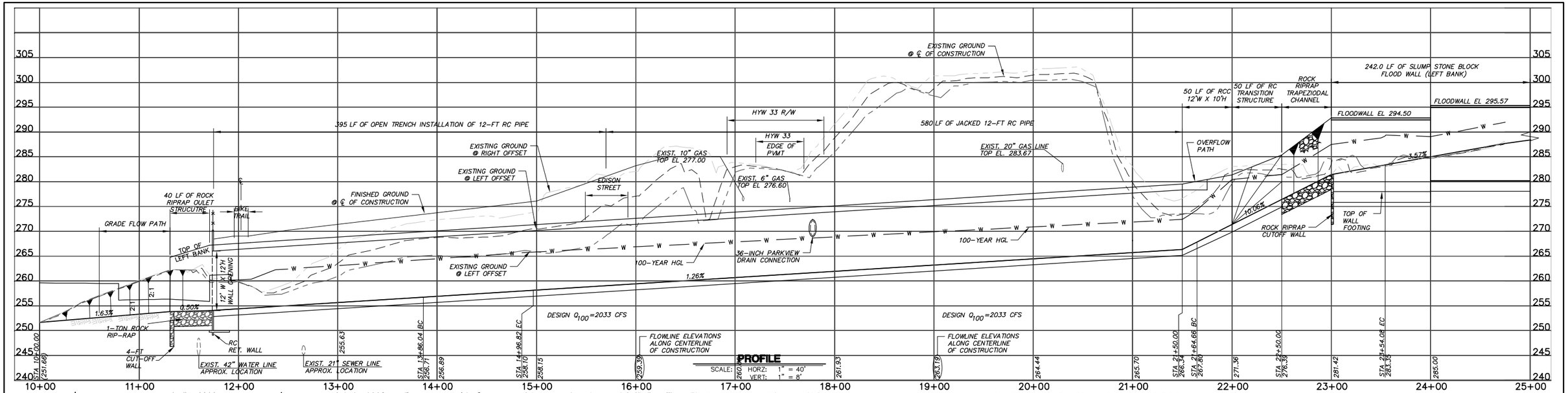

**SOURCE:** Impact Sciences, Inc., April 2013

FIGURE **4**

# Action Impacts

# APPENDIX 1

## Proposed Action Drawings




50% DESIGN
NOT FOR CONSTRUCTION

PLOT DATE: 3/25/13

SAVE DATE: 3/19/13 NALLAMD K:\DC\PROJECTS\81185 FRESNO CANYON FLOOD MITIGATION\DESIGN\DESIGN DRAWINGS\81185 PLAN.DWG

| | | | |
|---|---|---|---|
| D | | | |
| C | | | |
| B | | | |
| A | | | |
| △ | REVISION DESCRIPTION | APP. | DATE |

DESIGNED DEVI N | DRAWN DEVI N | CHECKED MASOOD J

PROJ. ENG. | RECOMMENDED

REG. NO. | DATE | APPROVED

**COUNTY OF VENTURA - PUBLIC WORKS AGENCY**
**VENTURA COUNTY WATERSHED PROTECTION DISTRICT**

SPEC NO –

PROJ. NO. 81185

**FRESNO CANYON FLOOD CONTROL IMPROVEMENTS**
12-FT RC PIPE – PLAN AND PROFILE

SHEET 2 OF 2

DRAWING NO. –

# APPENDIX 2

## Vascular Plants Observed within the Fresno Canyon Action Area

# Appendix 2
## Vascular Plants Observed within the Fresno Canyon Action Area

| Scientific Name | Common Name | Native Y/N |
|---|---|---|
| **Gymnosperms** | **Conifers** | |
| **Pinaceae** | **Pine Family** | |
| *Pinus muricata* | Bishop pine | **Y** |
| **Dicots** | **Flowering Plants** | |
| **Adoxaceae** | **Muskroot Family** | |
| *Sambucus nigra* L. subsp. *caerulea* (Raf.) Bolli | Blue elderberry | **Y** |
| **Anacardiaceae** | **Sumac Family** | |
| *Rhus integrifolia* (Nutt.) Brewer & S. Watson | Lemonadeberry | **Y** |
| *Schinus molle* L. | Peruvian pepper tree | **N** |
| **Apiaceae** | **Carrot Family** | |
| *Foeniculum vulgare* Mill. | Fennel | **N** |
| **Apocynaceae** | **Dogbane Family** | |
| *Vinca major* L. | Periwinkle | **N** |
| **Araliaceae** | **Ginseng Family** | |
| *Hedera helix* | English ivy | **N** |
| **Asteraceae** | **Sunflower Family** | |
| *Ambrosia psilostachya* DC. | Western ragweed | **Y** |
| *Artemisia californica* Less. | California sagebrush | **Y** |
| *Baccharis pilularis* DC. | Coyote brush | **Y** |
| *Baccharis salicifolia* (Ruiz Lopez & Pavon) Pers. | Mule fat | **Y** |
| *Helminthotheca echioides* (L.) Holub | Bristly ox-tongue | **N** |
| *Lessingia filaginifolia* (Hook. & Arn.) M.A. Lane | California-aster | **Y** |
| *Silybum marianum* (L.) Gaertn. | Milk thistle | **N** |
| *Xanthium* sp. | Cocklebur | **N** |
| ***Betulaceae*** | **Birch Family** | |
| *Alnus rhombifolia* Nutt. | White alder | **Y** |
| ***Brassicaceae*** | **Mustard Family** | |
| *Brassica nigra* (L.) W.D.J. Koch | Black mustard | **N** |
| ***Cactaceae*** | **Cactus Family** | |
| *Opuntia ficus-indica* (L.) Miller | Indian fig cactus | **N** |
| ***Cucurbitaceae*** | **Cucumber Family** | |
| *Marah fabacea* (Naudin) Greene | California man-root | **Y** |
| ***Fabaceae*** | **Legume Family** | |
| *Genista* sp. | Broom | **N** |
| ***Fagaceae*** | **Oak Family** | |
| *Quercus agrifolia* Nee | Coast live oak | **Y** |
| ***Juglandaceae*** | **Walnut Family** | |
| *Juglans californica* S. Watson | California black walnut | **Y** |

## Appendix 2 (continued)
**Vascular Plants Observed within the Fresno Canyon Action Area**

| Scientific Name | Common Name | Native Y/N |
|---|---|---|
| ***Lamiaceae*** | **Mint Family** | |
| *Marrubium vulgare* L. | Horehound | **N** |
| *Salvia leucophylla* Greene | Purple sage | **Y** |
| *Salvia mellifera* E. Greene | Black sage | **Y** |
| *Malva parviflora* L. | Cheeseweed | **N** |
| ***Myrtaceae*** | **Myrtle Family** | |
| *Eucalyptus* sp. | Eucalyptus | **N** |
| ***Phyrmaceae*** | **Lopseed Family** | |
| *Mimulus aurantiacus* Curtis | Bush monkeyflower | **Y** |
| **Platanaceae** | **Sycamore Family** | |
| *Platanus racemosa* Nutt. | Western sycamore | **Y** |
| **Polygonaceae** | **Buckwheat Family** | |
| *Eriogonum fasciculatum* Benth. var. *foliolosum* (Nutt.) Abrams | Leafy California buckwheat | **Y** |
| *Rumex crispus* L. | Curly dock | **N** |
| **Rosaceae** | **Rose Family** | |
| *Heteromeles arbutifolia* (Lindley) Roemer | Toyon | **Y** |
| *Rosa californica* Cham. & Schltdl. | California rose | **Y** |
| *Rubus armeniacus* Focke | Himalayan blackberry | **N** |
| **Salicaceae** | **Willow Family** | |
| *Populus fremontii* S. Watson | Fremont cottonwood | **Y** |
| *Salix lasiolepis* Benth. | Arroyo willow | **Y** |
| **Sapindaceae** | **Soapberry Family** | |
| *Acer macrophyllum* Pursh. | Big-leaf maple | **Y** |
| *Aesculus californica* (Spach) Nutt | California buckeye | **Y** |
| **Solanaceae** | **Nightshade Family** | |
| *Nicotiana glauca* Graham | Tree tobacco | **N** |
| **Viscaceae** | **Mistletoe Family** | |
| *Phoradendron* sp. | Mistletoe | **Y** |
| **Monocots** | **Grasses and Allies** | |
| **Poaceae** | **Grass Family** | |
| *Arundo donax* L. | Giant reed | **N** |
| *Avena fatua* L. | Common wild oats | **N** |
| *Bromus diandrus* Roth | Ripgut brome | **N** |
| *Bromus madritensis* L. ssp. *rubens* (L.) Husnot | Red brome | **N** |

# APPENDIX 3

## Special-Status Plant Species Recorded From the Project Vicinity

# Appendix 3
## Special-Status Plant Species Recorded From the Project Vicinity

| Scientific and Common Name | Status | | | Habitat Requirements | Elevation Range, Life Form, and Flowering Period | Potential Occurrence |
|---|---|---|---|---|---|---|
| | Federal | State | CNPS | | | |
| Aphanisma<br>*Aphanisma blitoides* | -- | -- | 1B.2 | Coastal bluff scrub, coastal dunes, coastal scrub. Bluffs and slopes near ocean in sandy or clay soils | 1-305m<br>AH<br>March-June | Low potential. Limited suitable habitat in action area. |
| Miles' milk-vetch<br>*Astragalus didymocarpus*<br>var. *milesianus* | -- | -- | 1B.2 | Coastal scrub; clay soils | 20-90m<br>AH<br>March-June | Low potential. Limited suitable habitat in action area. |
| Ventura Marsh milk-vetch<br>*Astragalus pycnostachyus*<br>var. *lanosissimus* | FE | SE | 1B.1 | Coastal dunes, coastal scrub, marshes and swamps (edges, coastal salt or brackish) | 15-1200m<br>PH<br>June-October | Not expected. No suitable habitat in action area. |
| Coulter's saltbush<br>*Atriplex coulteri* | -- | -- | 1B.2 | Coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grasslands; alkaline or clay soils | 3-460m<br>PH<br>March-October | Low potential. Limited suitable habitat in action area. |
| South coast saltscale<br>*Atriplex pacifica* | -- | -- | 1B.2 | Coastal bluff scrub, coastal dunes, coastal scrub, playas; alkaline soils | 0-140m<br>AH<br>March-October | Low potential. Limited suitable habitat in action area. |
| Davidson's saltscale<br>*Atriplex serenana* var. *davidsoni* | -- | -- | 1B.2 | Coastal bluff scrub, coastal scrub; alkaline soils | 10-200m<br>AH<br>April-October | Low potential. Limited suitable habitat in action area. |
| Late-flowered mariposa lily<br>*Calochortus fimbriatus* | -- | -- | 1B.2 | Chaparral, coastal scrub, valley and foothill grassland | 275-1905m<br>PH(b)<br>June-August | Low potential. Limited habitat in action area is highly disturbed. |
| Plummer's mariposa lily<br>*Calochortus plummerae* | -- | -- | 1B.2 | Coastal scrub, chaparral, valley and foothill grasslands, cismontaine woodland, lower montane coniferous forest; granitic, rocky soils | 100-1700m<br>PH (b)<br>May-July | Low potential. No typical habitat in the action area. |

## **Appendix 3** (continued)
### Special-Status Plant Species Recorded From the Project Vicinity

| Scientific and Common Name | Status | | | Habitat Requirements | Elevation Range, Life Form, and Flowering Period | Potential Occurrence |
|---|---|---|---|---|---|---|
| | Federal | State | CNPS | | | |
| Southern tarplant<br>*Centromadia parryi ssp. australis* | -- | -- | 1B.1 | Marshes and swamps, valley and foothill grasslands; marsh edges, vernal pool edges, alkaline soils | 0-425m<br>AH<br>May-November | Not expected. No suitable habitat in the action area. |
| Orcutt's pincushion<br>*Chaenactis glabriuscula* var. *orcuttiana* | -- | -- | 1B.1 | Coastal bluff scrub, coastal dunes; sandy soils | 0-100m<br>AH<br>January - August | Not expected. No suitable habitat in the action area. |
| Salt marsh birds'-beak<br>*Chloropyron maritimum ssp. orcuttiana* | FE | SE | 1B.2 | Coastal bluff scrub, coastal dunes; sandy soils | 0-100m<br>AH<br>January - August | Not expected. No suitable habitat in the action area. |
| Umbrella larkspur<br>*Delphinium umbraculorum* | -- | -- | 1B.3 | Cismontane woodland (mesic) | 400-1600m<br>PH<br>April-June | Low potential. Limited suitable habitat in action area and no known occurrences in project watershed. |
| Ojai fritillary<br>*Fritillaria ojaiensis* | -- | -- | 1B.2 | Broadleafed upland forest (mesic), chaparral, lower montane coniferous forest; rocky sites. | 300-998m<br>PH(b)<br>February-May | Low potential within project footprint, although moderate potential in broader survey area (oak-walnut woodland east of Ventura Ave.). No known occurrences in lower Fresno Canyon. |
| Mesa horkelia<br>*Horkelia cuneata* var. *puberula* | -- | -- | 1B.1 | Chaparral (maritime), cismontane woodland, coastal scrub; sandy or gravelly soils | 70-810m<br>PH<br>February-September | Low potential within project footprint, although moderate potential in broader survey area (oak-walnut woodland east of Ventura Ave.). No known occurrences in lower Fresno Canyon. |
| California satintail<br>*Imperata brevifolia* | -- | -- | 2.1 | Chaparral, coastal scrub, Mojavean desert scrub; mesic sites (alkali seeps, riparian) | 0-1215m<br>RH<br>September-May | Low Potential. Limited suitable habitat in action area and no known occurrences in project watershed. |

## **Appendix 3** (continued)
**Special-Status Plant Species Recorded From the Project Vicinity**

| Scientific and Common Name | Status | | | Habitat Requirements | Elevation Range, Life Form, and Flowering Period | Potential Occurrence |
|---|---|---|---|---|---|---|
| | Federal | State | CNPS | | | |
| Coulter's goldfields<br>*Lasthenia glabrata ssp. coulteri* | -- | -- | 1B.1 | Coastal salt marshes, playas, valley and foothill grassland, vernal pools; usually found in alkaline soils in playas, sinks and grasslands | 1-1220m<br>AH<br>February-June | Low potential. Limited habitat in action area is highly disturbed. |
| Robinson's pepper-grass<br>*Lepidium virginicum* var. *robinsonii* | -- | -- | 1B.2 | Chaparral, coastal scrub; dry soils | 1-885m<br>AH<br>January-July | Low potential. Limited suitable habitat in the action area. |
| Mexican malacothrix<br>*Malcothrix similis* | -- | -- | 1A | Coastal dunes | 0-40m<br>AH<br>April-May | Not expected. No suitable habitat in the action area. |
| Ojai navarretia<br>*Navarretia ojaiensis* | -- | -- | 1B.1 | Chaparral, coastal scrub, valley and foothill grassland; openings in scrub and grassland | 275-620m<br>AH<br>May-July | Moderate potential east of Ventura Ave., low potential elsewhere. No known occurrences in lower Fresno Canyon. |
| Chaparral nolina<br>*Nolina cismontana* | -- | -- | 1B.2 | Chaparral, coastal scrub; sandstone or gabbro soils | 140-1275m<br>S(e)<br>May-July | Low potential. Limited suitable habitat in the action area. |
| Sanford's arrowhead<br>*Sagittaria sanfordii* | -- | -- | 1B.2 | Marshes and swamps (freshwater) | 0-650m<br>RH<br>May-October | Not expected. No suitable habitat in the action area. |
| Salt Spring checkerbloom<br>*Sidalcea neomexicana* | -- | -- | 2.2 | Alkali springs and marshes within chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, playas. | 15-1530m<br>PH<br>March-June | Not expected. No suitable habitat in the action area. |
| Southern jewel-flower<br>*Streptanthus campestris* | -- | -- | 1B.3 | Chaparral, lower montane coniferous forest, pinyon-juniper woodland in open rocky areas | 900-2300m<br>PH<br>April-July | Not expected. No suitable habitat in the action area. |

## **Appendix 3** (continued)
## Special-Status Plant Species Recorded From the Project Vicinity

**STATUS KEY:**

Federal

FE: Federally Listed Endangered Species

State

SE: State Endangered

CNPS

*Rare Plant Rank 1A: Plants presumed extinct in California*
*Rare Plant Rank 1B: Plants rare, threatened or endangered in California and elsewhere*
*Rare Plant Rank 2: Plants rare, threatened and endangered in California but more common elsewhere*
*2.1 : Seriously threatened in California*
*2.2 : Fairly threatened in California*

*LIFE FORM KEY:*

| | | | |
|---|---|---|---|
| *AH:* | *Annual Herb* | *(b):* | *bulb* |
| *PH:* | *Perennial Herb* | *(d):* | *deciduous* |
| *RH:* | *Rhizomatous Herb* | *(e):* | *evergreen* |
| *S:* | *Shrub* | | |

# APPENDIX 4

## Special-Status Wildlife Species Recorded From the Project Vicinity

# Appendix 4
## Special-Status Wildlife Species Recorded From the Action area

| Common Name<br>*Scientific Name* | Status<br>Federal | <br>State | Habitat Requirements | Potential Occurrence on the Project Site |
|---|---|---|---|---|
| **INVERTEBRATES** | | | | |
| Sandy beach tiger beetle<br>*Cicindela hirticollis gravida* | -- | sa | Dry, light-colored, moist sands adjacent to non-brackish water and away from wave action. | Not Expected. No suitable habitat on-site. |
| Globose dune beetle<br>*Coelus globosus* | -- | sa | Coastal sand dune habitat; foredunes and hummocks, usually beneath surface | Not Expected. No suitable dune habitat on-site. |
| Monarch butterfly (wintering sites)<br>*Danaus plexippus* | -- | sa | Winter roost sites located in wind-protected tree groves (gum trees, Monterey pine, and cypress trees), with water sources nearby. | Not Expected. Individual monarchs may occur, but no suitable wintering roost sites are present in the project vicinity. |
| **FISHES** | | | | |
| Santa Ana sucker<br>*Catostomus santaanae* | FT | SSC | Coastal rivers and streams and prefer sand-rubble-boulder bottoms in cool, clear water with algae for foraging. | Not Expected. This species is not known from and not native to the Ventura River. |
| Unarmored threespine stickleback<br>*Gasterosteus aculeatus willimasoni* | FE | SE | Weedy pools, backwaters and among emergent vegetation at stream edges. | Not Expected. This species is not known from the Ventura River. |
| Tidewater goby<br>*Eucyclobobius newberryi* | FE | SSC | Brackish water habitats along California coastline | Not Expected. Suitable brackish water does not occur this far inland from ocean. |
| Southern Steelhead (So. CA DPS)<br>*Oncorhynchus mykiss* | FE | SSC | Seasonal to perennial coastal streams with suitable gravel substrate for spawning. | **High Potential**. Steelhead are known from this river and in the project vicinity. |

**Appendix 4** (continued)
**Special-Status Wildlife Species Recorded From the Action area**

| Common Name<br>*Scientific Name* | Status<br>Federal | <br>State | Habitat Requirements | Potential Occurrence on the Project Site |
|---|---|---|---|---|
| **AMPHIBIANS & REPTILES** | | | | |
| Coast Range newt<br>*Taricha torosa* | -- | SSC | Moist habitats under woody debris, in crevices and animal burrows. Aquatic breeders in ponds and slow moving pools in streams. | Low Potential. This species not known from the project vicinity and suitable upland and breeding habitats are very limited on and adjacent to project site. |
| California red-legged frog<br>*Rana draytonii* | FT | SSC | Lowlands and foothills in or near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation. | Moderate to High Potential. Suitable habitat occurs in the area of the project and this species has been documented in the Ventura River, but suitable perennial or near perennial pools not present within the work or buffer zones identified for this project. |
| Western pond turtle<br>*Emys marmorata* | -- | SSC | Streams, rivers, ponds, freshwater marshes, and lakes with growth of aquatic vegetation. | Low to Moderate Potential. Suitable habitat occurs in the area of the project, but suitable perennial or near perennial pools not present within the work or buffer zones identified for this project. |
| Silvery legless lizard<br>*Anniella pulchra pulchra* | -- | SSC | Sandy or loose loamy soils under sparse vegetation. Soil moisture is essential. | Low Potential. Very limited suitable habitat present in the action area where moist soils occur outside of the banks of the river. |
| Coast horned lizard<br>*Phrynosoma blainvillii* | -- | SSC | Relatively open grasslands, scrublands, and woodlands with fine, loose soil. | Low Potential. Species known from the area, but habitats within the work and buffer zones not typical for this species. |
| Coastal whiptail<br>*Aspidoscelis tigris stejnegeri* | -- | sa | Open areas in semiarid grasslands, scrublands, and woodlands. | Low Potential. Species known from the area, but habitats within the work and buffer zones not typical for this species. |

**Appendix 4** (continued)
**Special-Status Wildlife Species Recorded From the Action area**

| Common Name<br>*Scientific Name* | Status<br>Federal | <br>State | Habitat Requirements | Potential Occurrence on the Project Site |
|---|---|---|---|---|
| Two-striped garter snake<br>*Thamnophis hammondii* | -- | SSC | Perennial and seasonal streams and man-made lakes and stock ponds; requires dense riparian vegetation. | Moderate Potential. Species known from the watershed and some habitat present on-site. However, species more commonly occurs in ponded areas; none occurs on the project site. |
| **BIRDS** | | | | |
| Tri-colored blackbird<br>*Agelaius tricolor* | -- | SSC | Colonial nesters near open water | Moderate Potential. Small amount of suitable habitat occurs within the project buffer zone. |
| Burrowing owl<br>*Athene cunicularia* | -- | SSC | Open, dry grasslands, deserts & scrublands with low-growing vegetation | Low Potential. Within the project work and buffer zones very little suitable habitat is present. |
| Western snowy plover<br>*Charadrius alexandrines nivosus* | FT | SSC | Sandy beaches, salt pond levees & shores of large alkali lakes | Not Expected. No suitable habitat on or adjacent to site. |
| Western yellow-billed cuckoo<br>*Coccyzus americanus occidentalis* | FC | SE | Riparian forests with dense understories along larger rivers. | Moderate Potential. Riparian habitat on and adjacent to site is suitable for nesting. However, no recent records of occurrence in project vicinity. |
| Belding's savannah sparrow<br>*Passerculus sandwichensis beldingi* | -- | SE | Coastal salt marshes with *Salicornia* on and near tidal flats | Not Expected. No suitable habitat on or adjacent to site. |
| Bank swallow<br>*Riparia riparia* | -- | ST | Colonial nester; primarily in riparian and lowland habitats west of desert. | Not Expected. Very few documented occurrences in area and no suitable habitat present on-site. |
| California least tern<br>*Sternula antillarum browni* | FE | SE | Colonial breeding on bare or sparsely vegetated, flat areas including beaches, alkali flats, landfills and some paved areas. | Not Expected. No suitable habitat present on-site. |

## **Appendix 4** (continued)
## Special-Status Wildlife Species Recorded From the Action area

| **Common Name**<br>***Scientific Name*** | **Status** | | **Habitat Requirements** | **Potential Occurrence on the Project Site** |
|---|---|---|---|---|
| | **Federal** | **State** | | |
| Least Bell's vireo<br>*Vireo bellii pusillus* | FE | SE | Low riparian scrub in vicinity of water or in dry river beds. | **High Potential**. Known from this watershed and action area, and suitable habitat is present within work area and buffer. |
| **MAMMALS** | | | | |
| Mexican long-tongued bat<br>*Choeronycteris mexicana* | -- | SSC | Roosts in caves and in and around buildings. Feeds on nectar and pollen of night-blooming succulents. | Not Expected. No suitable roosting or foraging habitat on or adjacent to site and site outside of typical range for this species. |
| Hoary bat<br>*Lasiurus cinereus* | -- | sa | Dense trees for cover and open areas or habitat edges for feeding; requires water | **High Potential**. Suitable roosting and foraging habitat present within the work buffer zone. |
| Pallid bat<br>*Antrozous pallidus* | -- | SSC | Deserts, grasslands, woodlands & forests; open dry habitats with rocky areas for roosting | Moderate Potential. May occur in area and may periodically forage on-site, but species usually prefers more arid habitats than occur within the work and buffer areas. |
| Western mastiff bat<br>*Eumops perotis californicus* | -- | SSC | Arid-semi arid habitats including conifer & deciduous woodlands, coastal scrub, chaparral, grasslands; roosts in crevices in cliff faces, high buildings, trees & tunnels | Low to Moderate potential. May occur as infrequent forager, but species uncommon in area and limited roosting habitat present in work or buffer areas |
| Dulzura pocket mouse<br>*Chaetodipus californicus femoralis* | -- | SSC | Chaparral, coastal scrub, and grasslands. | Not Expected. This species does not typically occur beyond San Diego County in California. Old historic LA Co Museum record. |

## **Appendix 4** (continued)
## Special-Status Wildlife Species Recorded From the Action area

| Common Name<br>*Scientific Name* | Status | | Habitat Requirements | Potential Occurrence on the Project Site |
|---|---|---|---|---|
| | Federal | State | | |
| San Diego desert woodrat<br>*Neotoma lepida intermedia* | -- | SSC | Chaparral and coastal sage scrub; rock outcrops, rocky cliffs and slopes | Moderate Potential. Known from area, but only limited suitable habitat in upland buffer zone. |
| American badger<br>*Taxidea taxus* | -- | SSC | Drier open stages of shrub, forest, and herbaceous habitats with friable soils. | Not Expected. No suitable habitat in work or buffer areas. |

**KEY:**

(nesting) = For most taxa the CNDDB is interested in sightings for the presence of resident populations. For some species (primarily birds), the CNDDB only tracks certain parts of the species range or life history (e.g., nesting locations). The area or life stage is indicated in parenthesis after the common name.

Status:

Federal -- US Fish and Wildlife Service
FE: Federally Endangered
FT: Federally Threatened

State -- California Department of Fish and Game
SE: State-listed Endangered Species
ST: State-listed Threatened Species

CFP: California Fully Protected Species
SSC: California Species of Special Concern
WL: CDFG Watch List

sa: California Special Animal (species with no official federal or state status, but are included on CDFG's Special Animals list)

# APPENDIX 5

## Assessment of Pre-Project Aquatic Habitat in the Ventura River at the Fresno Canyon Confluence

# Assessment of Pre-Project Aquatic Habitat in the Ventura River at the Fresno Canyon Confluence


**Prepared For:**
Dave Crawford
Impact Sciences
3892 Chapman Place
Riverside, CA 92506
805-377-8207

**Prepared By:**
Mark A. Allen
Normandeau Associates, Inc.
890 L Street
Arcata, CA 95521
707-822-8478


**October 25, 2012**

**CONTENTS** **PAGE**

# Assessment of Pre-Project Aquatic Habitat in the Ventura River at the Fresno Canyon Confluence

## INTRODUCTION

The small community of Casitas Springs, California, is subject to periodic flooding due to overspill of runoff from the ephemeral stream emerging from Fresno Canyon (Figure 1). A concrete box-culvert structure was constructed in the 1970's to route flood runoff through the community and into the mainstem Ventura River. However culvert overbanking has continued to occur at an interval of approximately once every 10 years (URS 2009); consequently the Ventura County Watershed Protection District (VCWPD) is in the final planning stages to enlarge the flood capacity of lower Fresno Canyon by constructing a new and larger flood control structure to prevent future flooding of the Casitas Springs residence area (Hawks and Associates 2010).

Fresno Canyon is a typically dry arroyo that meets the Ventura River approximately five miles upstream from the Pacific Ocean. The Ventura River is an important watershed for the continued persistence and potential restoration of Southern California steelhead, *Oncorhynchus mykiss*, a federally endangered species (NMFS 2005, 2006). Although the Ventura River and its principal tributaries are listed as critical habitat for southern steelhead, Fresno Canyon contains surface water only during periodic and short-duration storm events, and consequently is not considered as spawning or rearing habitat for *O. mykiss*, nor is it listed as critical habitat. However the confluence of Fresno Canyon with the Ventura River and the associated riparian zone are within critical habitat, and consequently the development of the Fresno Canyon Flood Mitigation Project (project) has the potential impact southern steelhead directly or through alteration of the species' critical habitat.

The mainstem Ventura River between the San Antonio Creek confluence and Foster Park is historically known for being productive rearing habitat for juvenile *O. mykiss* (Moore 1980, Capelli 1997), which has been recently confirmed by ongoing steelhead distribution and abundance studies (TRPA 2007, 2008, 2009, 2010, Normandeau 2011).

Also, in recent years spring spawning surveys by the NMFS and the Casitas Municipal Water District (CMWD) have demonstrated high levels of *O. mykiss* spawning activities in this area of the mainstem Ventura River. These observations illustrate the importance of the mainstem Ventura River habitat in the vicinity of Fresno Canyon to the population of southern steelhead in the Ventura River Basin.

Normandeau Associates, Inc. (NAI) was contracted by Impact Sciences, a consultant to the VCWPD, to assess the pre-project aquatic habitat conditions in the mainstem Ventura River for *O. mykiss* in the vicinity of the Fresno Canyon confluence, and to identify any potential impacts or mitigation measures not previously addressed in the project Biological Assessment (FEMA/URS 2009) or in subsequent correspondence with NMFS, California Department of Fish & Game (DFG), or other resource agencies. Although other listed aquatic or riparian-associated species may be present in the project area (e.g., California red-legged frogs), this report will only discuss pre-project habitat conditions and potential impacts to *O. mykiss*.

## PROJECT DESCRIPTION

The Project design alternatives under consideration as of September 9, 2012 include a one-ton non-grouted rip-rap apron at the confluence of Fresno Canyon and the Ventura River (VCWPD 2012). The proposed apron will be approximately 120 ft in width and 30-50 ft in length, with a 12 ft wide culvert conveying Fresno Canyon storm flows exiting closer to the southern end of the apron. The apron will include a concrete retaining wall at the leading edge of the apron, and a non-grouted rock cutoff wall along the trailing edge of the apron. The northern edge of the apron will be joined to an existing, unmaintained rip-rap bank that occurs between the proposed outlet location and the existing Fresno Canyon outlet to the north. A 40 ft long curved section of one-ton rock rip-rap will be placed to a depth of nine ft (below the channel bottom) along the southern edge of the apron to meet with the existing eastern bank of the Ventura River. This curved rip-rap bank will terminate in a one-ton rock cutoff wall to stabilize the bank protection.

A graded flow path approximately 30 ft wide and 70 ft long will be bladed through existing riparian vegetation in front of the culvert mouth into the high flow channel of the Ventura River to Fresno Canyon storm flows. Previous project maps illustrated in Hawks and Associates (2010) indicated that oak, walnut, sycamore, or large heritage trees did not occur in the immediate vicinity of the outlet apron, the southern rip-rap bank, or the graded flow path, although the extent of the construction-related impact area was not specified in VCWPD (2012).

Details regarding the project design alternatives upstream of the Fresno Canyon outlet apron can be found in VCWPD (2012), but this report will limit analysis of existing conditions and potential impacts to the Ventura River proper and to the immediate vicinity of the Fresno Canyon outlet structure.

## STUDY AREA

A detailed description of the general landscape and riparian conditions in the vicinity of the Fresno Canyon confluence is presented in FEMA/URS (2009). This study focused on the aquatic habitat, with emphasis on stream substrate characteristics, in the mainstem Ventura River immediately downstream and upstream of the Fresno Canyon confluence.

The lower "test" reach followed the Ventura River mainstem channel for 0.8 river miles from the Casitas Vista Bridge upstream to a point opposite the proposed location of the new Fresno Canyon outlet (Figure 1). The upper "control" reach extended approximately 1.08 river miles upstream from the Fresno Canyon outlet to just below (0.05 mi) the San Antonio Creek confluence. The upstream control reach was longer than the downstream test reach in order to encompass the same number of gravel patches in each reach.

Aquatic and riparian characteristics were generally similar in the test and control reaches, however the test reach contained more stands of *Arundo donax* than did the control reach; and approximately 0.8 mi of the control reach flowed through a relatively new channel (Figure 1) that captured the majority of flow sometime during the winter or spring of 2010-2011. The "new" channel contained approximately 90% of the total flow (11 cfs at the Foster Park gage) at the time of the March 2012 survey, but possessed a relatively sparse riparian community dominated by riparian scrub species. The remaining 0.3 mi of the control reach remained within the original, more established channel bordered by larger tree species. The potential differences in substrate characteristics between the old channel and new channel areas are discussed below.

A third difference in the two reaches was the greater extent of rip-rap levee embankment along the low flow channel in the control reach, whereas the test reach only flowed along riprap at two spur-dike pools in lower Foster Park.

At the time of the March 2012 survey, the mainstem Ventura River did not flow adjacent to the eastern embankment except at the bottom of the test reach (by the Foster park spur-dikes) about 0.7 miles below the Fresno Canyon confluence, and along the upper one-third of the control reach about 0.8 miles above the Fresno Canyon confluence. About 900 ft of the "old" portion of the control reach, which contained a minor proportion (~10%) of the total flow, was adjacent to the east-bank rip-rap levee, approximately 2,000 ft upstream of the Fresno Canyon confluence. Consequently, the active channel of the Ventura River in March 2012 did not flow along the eastern embankment in the vicinity of the Fresno Canyon confluence.

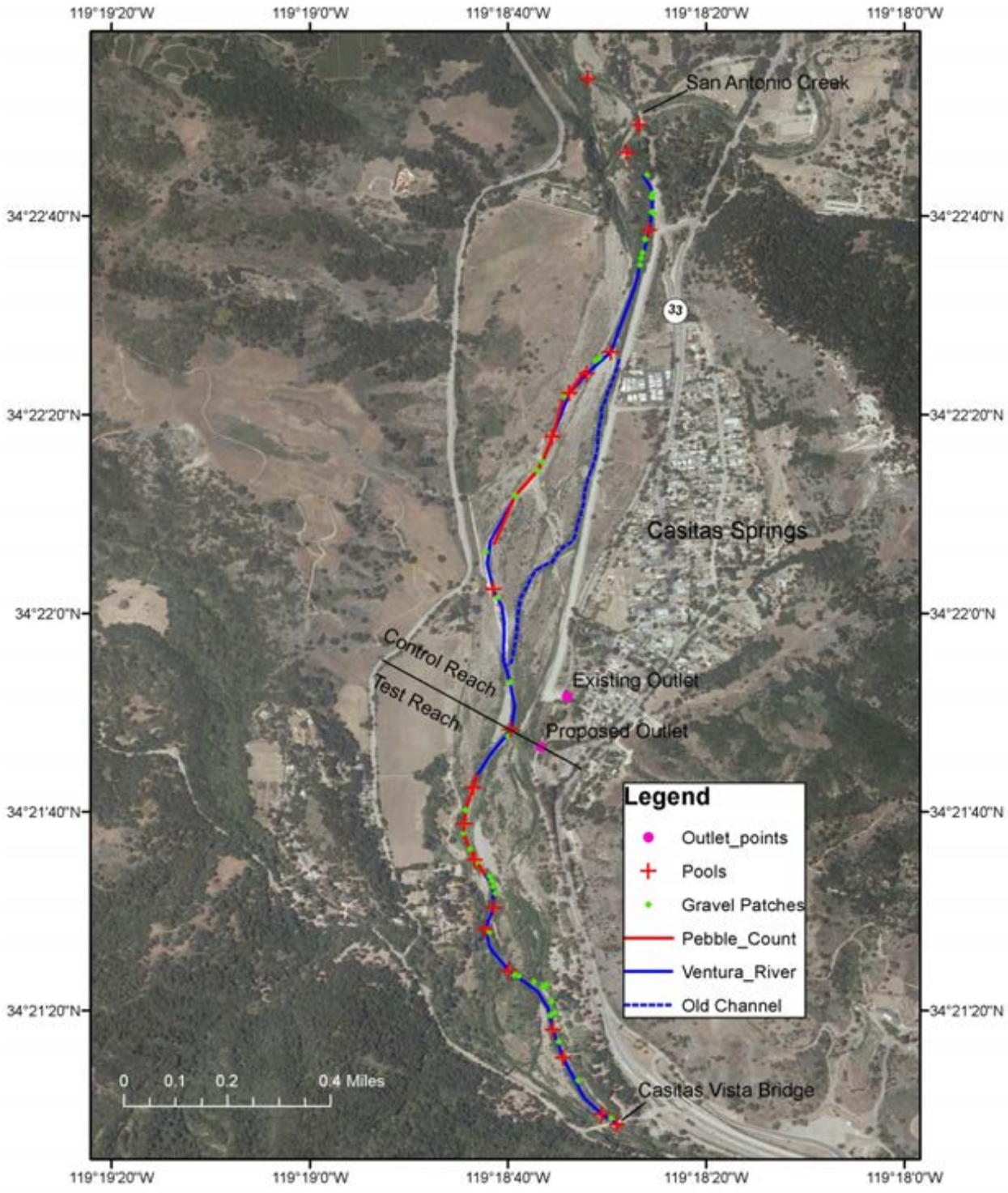



Figure 1. Map of Fresno Canyon confluence showing Ventura River test and control reaches (blue line), assessed gravel patches (green circles), pebble count bars (red lines), surveyed pool habitats (red plus's), the "old" split channel (blue dashed line), and other features.

# METHODS

This pre-project study was composed of the following study elements, with effort distributed above and below the Fresno Canyon confluence:

1. assessment of fines in spawning gravels;
2. assessment of substrate particle sizes in open bar reaches;
3. delineation of the active channel; and
4. assessment of abundance of *O. mykiss* in pool habitats

Differences in substrate characteristics or fish abundance between test and control reaches in this pre-project assessment are intended to represent baseline conditions existing in the mainstem Ventura River during a single point in time prior to project construction. A post-project assessment utilizing the same survey protocols is therefore recommended to assess any construction-related impacts to downstream substrate characteristics or *O. mykiss* abundance.

1. Assessing Fines in Spawning Gravels

Reproduction of *O. mykiss* requires suitable spawning substrate in which to dig a nest ("redd") to bury their eggs and allow successful incubation, hatching, and emergence of fry into the water column. Excessive fine sediment (e.g., sand, silt, etc.) in salmonid spawning areas can impact successful reproduction by several mechanisms, including embedding and immobilizing the superficial layer of spawning gravel; impeding subsurface flow of water that provides oxygen to the developing embryos and removes metabolic waste products; and preventing movement of hatched embryos within and out of the gravel substrate (Phillips et al. 1975, Chapman 1988). Consequently, project-related changes in the amount of fine sediments within mainstem Ventura River spawning areas are a significant concern.

To evaluate this potential impact, the percentage of fines in spawning gravels was assessed in the test reach and in the control reach prior to project construction. Identification of potential spawning areas (e.g., gravel patches) was initially conducted in concert with the NMFS redd survey team (Rick Bush, NMFS) for one-half day in order to ensure consistency in selection of areas for assessing fines.

Fines within potential spawning areas was assessed using the U.S. Forest Service (USFS) Region 5 protocol "Percent Fines: Pool Tail Substrate" (USFS 1995), except that all potential spawning areas were assessed whether in pool tails, riffles, glides, or run habitats. Potential spawning areas were identified while walking upstream, where all patches of relatively homogenous substrate dominated by gravel-sized particles (2-64 mm intermediate diameter) and at least 10-20 $ft^2$ in area were assessed for particle size distributions. Spawning *O. mykiss*, like most salmonids, typically spawn in relatively homogenous patches of gravel-sized material, preferably containing small amounts of fine particles, and possessing water velocities of 0.5-3.0 feet per second (Normandeau habitat suitability files). Gravel patches were assessed in several pool tails that did not

exhibit sufficient velocities to support *O. mykiss* spawning during the March 2012 survey, but were considered to be potentially suitable at higher flow levels. Gravel deposits were not assessed if located well upstream of pool tails where water velocities were judged unlikely to be suitable under a range of typical spring flows.

Substrate was assessed in each spawning area by tossing a wire-frame grid at one or more "random" locations within each gravel patch. The number of grid tosses in each gravel patch was dependent upon patch size, with larger patches receiving 8-10 grid assessments. On average, gravel patches in both reaches were assessed by one grid toss per 50 $ft^2$ of gravel. The wire frame grid used in this assessment was 256 x 256 mm square and contained seven sets of crisscrossing wires, which produced 49 intersections. The substrate particle located immediately below each of the intersections and at one of the frame corners was visually classified, resulting in total of 50 points per grid location. The number of occurrences of each substrate particle size was multiplied by two to get percent composition by substrate type at each grid location. Substrate class was defined according to the modified Wentworth particle size scale (Table 1). "Fines" were defined as organic matter or inorganic particles <2 mm in diameter (clay/mud, silt, or sand).

Table 1. Substrate size classes used for assessment of spawning areas above and below the Fresno Canyon confluence.

| Substrate Class | Size Range (mm) |
|---|---|
| Organic Matter | - |
| Clay | <0.0004 |
| Silt | 0.0004 - 0.062 |
| Sand | 0.062 - 2.0 |
| Gravel | 2.0 - 64 |
| Cobble | 64 - 256 |
| Boulder | >256 |
| Bedrock | - |

Additional data collected at each gravel patch included eye-estimated surface area ($ft^2$), waypoints recorded with a handheld GPS unit, habitat type where the gravel patch was located, presence of *O. mykiss* redds, including the number and estimated size of redd-associated fish, and miscellaneous reference notes.

Statistical comparison of percent fines in spawning areas in the test versus the control reaches was conducted using the two sample Kolmogorov-Smirnov non-parametric test (Sokal and Rolf 1969). Two separate tests were conducted, one test treating the percent fines for each grid measurement as an independent sample, and one test using mean percent fines for each gravel patch (e.g., average values based on multiple grid measurements in large patches). The first test was 'self-weighting" since the number of grid samples in each reach was proportional to the total area of gravel patches in each reach, and gave more emphasis on larger gravel patches that received multiple grid tosses. However, each grid sample was not truly independent since grid data from multiple tosses in a single large patch would likely be more similar than grid data based on individual tosses in separate patches. The second test ignored the potential influence

of different gravel patch sizes or differences in overall gravel area between reaches, but mean values from individual patches did represent independent samples.

2. Assessing Substrate Particle Sizes on Open Bars

Substrate quality in non-spawning areas, such as pool habitats, high gradient riffles, lateral cobble bars, etc. is an important component of overall aquatic habitat suitability due to its influence on fish food (invertebrate) production, instream shelter, establishment of aquatic or riparian vegetation, etc (Marcus et al. 1990). Consequently, a second, independent assessment of instream *and* out-of-water substrate characteristics was conducted using a modified Wolman pebble-count protocol in two open-bar reaches, one reach downstream of the Fresno Canyon confluence, and one reach upstream of the confluence (Figure 1). This assessment was conducted to compliment the instream gravel surveys that emphasized substrate quality solely within spawning habitats.

Open-bar reaches were selected for pebble counts because much of the Ventura River mainstem is bordered by thick stands of riparian vegetation, which would make assessment of out-of-water substrate characteristics difficult. Secondly, substrate particles in thickly vegetated areas tend to be dominated by organic matter or fines, which would also make detection of potential post-project introduction of fine materials difficult. Consequently, pebble counts were conducted in two reaches that possessed relatively open, low-slope cobble-dominated bars along one or both banks.

A wide variety of Wolman pebble-count protocols have been described in the literature; the protocol followed in this study utilized components of the EMAP protocol and the PIBO protocol, as described in Bunte et al. (2009). The control reach was approximately 1,900 ft in length, which represented 23 bankfull widths, whereas the test reach open bar was shorter at 1,000 ft in length, or 12 bankfull widths. Mean bankfull widths were estimated at 82 ft in both reaches. Bankfull indicators included rapid changes in bank slope or elevation, or changes in riparian vegetation or other organic debris.

Ten cross-sectional transects were evenly spaced along each study reach using a laser rangefinder. Transects extended across the bankfull width of the stream channel (e.g., encompassing both in-water and out-of-water open-bar habitat), and were marked at endpoints with labeled flagging. A tape was extended across each transect for collection of pebble counts along evenly spaced intervals, where the sampling interval distance was calculated to yield 20 pebble counts per transect (e.g., total transect length [ft] divided by 20). This sampling fraction produced a total of approximately 200 pebble counts for each reach.

Pebble counts were conducted by traversing the transect along the tape to the pre-determined station, and then blindly reaching directly below the tape with a pointed finger until a particle was touched. That particle was dislodged and its intermediate axis size was determined by dropping the particle through a substrate template. The substrate template utilized the 0.5 phi scale shown in Table 2. Fines and embedded or large

immovable particles were visually assessed. Surface layers of algae or loose organic matter were wiped aside to assess the underlying particles.

Table 2. Particle size classes used in pebble counts.

| Max Size (mm) |
|---|
| 2 |
| 4 |
| 5.7 |
| 8 |
| 11.3 |
| 16 |
| 22.5 |
| 32 |
| 45 |
| 64 |
| 90 |
| 128 |
| 180 |
| 256 |
| 362 |
| >362 |

Pebble count data were analyzed using the excel spreadsheet program "Analyzing pebble count data collected by size classes" (version 1.0a), which calculated various pebble count statistics (e.g., D16, D50, D84) for each reach, and also statistically compared differences in percentage of fines between reaches using contingency tables and likelihood ratio chi-square statistics (Potyondy & Bunte 2002).

3. Delineation of the Active Channel

The outlet of the proposed Fresno Canyon channels will enter the Ventura River floodplain on the eastern embankment, consequently the active channel of the mainstem Ventura River was delineated in order to determine where and to what extent the channel flowed along the eastern bank. Also, existing rip-rap armoring occurs along the eastern bank upstream of the project, and additional rip-rap armoring and project related concrete structures are proposed to be constructed at the Fresno Canyon outlet (URS 2009). The Foster Park Bank Protection Project (Hawks and Associates 2010), if carried forward, will also likely result in additional rip-rap armoring along the eastern bank downstream of the Fresno Canyon outlet.

Because rip-rap bank armoring can produce significant effects on instream and riparian habitat, the extent of contact between the active Ventura River mainstem and the eastern embankment will influence the magnitude of potential impacts of the Fresno Canyon project on *O. mykiss* habitat. Scour that occurs at the base of exposed rip-rap banks during high flow events can lead to the "capture" of the active low-flow channel. Consequently, the pre-project active channel was delineated upstream and downstream of the Fresno Canyon confluence within the test and control reaches. The channel delineation was produced through the majority of each reach by reference to waypoints collected at each instream gravel patch, which effectively marked the mainstem channel. The channel bifurcation which produced the "old" and "new" channels in the control reach upstream of the Fresno Canyon confluence (previously described), was delineated using tracklog recordings of both channels from a handheld GPS unit (Figure 1).

4. Abundance of *O. mykiss* in Pool Habitats

All mainstem pool habitats encountered in each reach were surveyed using single-pass dive counts by one diver wearing a wetsuit, mask, and snorkel. The test reach contained 10 pool habitats, whereas the control reach contained seven pools. Consequently, three additional pools were sampled above the control reach boundary in order to equalize sample sizes between reaches. After arriving at each pool, the diver carefully entered the

water at the lower boundary and performed a length calibration exercise by inspecting a wrist-mounted ruler incremented at 10, 20, and 30 cm. After size calibration, the diver slowly progressed upstream to the pools upper boundary while scanning the water column for *O. mykiss*. All observed *O. mykiss* were recorded on an underwater dive slate with their lengths eye-estimated by reference to the wrist-mounted ruler. The diver attempted to inspect all areas of instream cover, however some pools contained very dense aggregations of instream *Arundo* branches and leaves which could not be thoroughly searched; consequently the resulting dive counts in many units should be considered as minimum estimates. Other species of fish or aquatic vertebrates were noted when observed.

After each dive, pool dimensions were measured using a laser rangefinder to record pool length, and channel widths at six equally spaced cross-sections. A graduated wading rod was used to measure pool depths at ¼, ½, and ¾ channel widths at each cross-section (for a total of 18 depths), as well as maximum pool depth. Unit length, mean width, and mean depth was used to calculate pool surface area and volume.

Water temperature was measured periodically throughout the day. Underwater visibility was conservatively estimated in morning, noon, and afternoon periods (or when instream conditions changed) by measuring the distance at which the diver could confidently identify a 2 inch, trout-colored lure. All dive pools were digitally photographed, and their locations marked with a handheld GPS unit.

## RESULTS

This pre-project survey was conducted from 28-31 March 2012, at a streamflow of approximately 11 cfs (measured at USGS Foster Park gage #8500). Immediately prior to the spawning gravel survey, one-half day was spent accompanying Rick Bush of NMFS on a bi-weekly spawning survey in the mainstem Ventura River in order to maximize consistency in the delineation of spawning areas. Note that this survey did not attempt to characterize or enumerate *O. mykiss* redds, because substrate characteristics of active redd areas are modified by the digging action of the fish. Gravel substrate characteristics were, however, assessed in all gravel patches where redds were observed.

1. Assessing Fines in Spawning Gravels

Twenty-seven individual gravel patches were assessed in each reach, although mean patch size, total patch area, and number of individual grid samples was greater in the longer (1.08 mi) control reach than in the shorter (0.8 mi) test reach (Table 3). Patch density ($ft^2$/mile), however, was slightly greater in the test reach (5,823 $ft^2$/mile) than in the control reach (5,532 $ft^2$/mile). The longitudinal distribution and size of individual gravel patches is illustrated in Figure 2, which also shows which patches contained *O. mykiss* redds (note: some patches contained multiple redds). Most gravel patches ranged in size from 50 to 300 $ft^2$, but two patches were approximately 800-900 $ft^2$ in size. The lower of the two large patches was deposited on the upstream side of the Foster Park dam, which also contained multiple *O. mykiss* redds. Large gravel deposits also occurred

adjacent to a rip-rap bank just downstream of the San Antonio Creek confluence, where high spawning activity was also observed.

Table 3. Sampling statistics for test and control reaches.

| Variable | Test | Control |
|---|---|---|
| Reach Length *mi* | 0.80 | 1.08 |
| # Gravel Patches | 27 | 27 |
| Total Patch Area $ft^2$ | 4,658 | 5,975 |
| Patch Density $ft^2/mi$ | 5,823 | 5,532 |
| Avg Patch Area $ft^2$ | 172.5 | 221.3 |
| # Grid Samples | 100 | 129 |
| Pebble Count Bar Length *ft* | 1,011 | 1,929 |
| # Pebble Count Particles | 198 | 199 |
| # Pools | 10 | 10 [1] |

[1] three of the pools were were located just above the control reach

As seen in Figure 2, the middle portion of the control reach contained relatively few spawnable gravel patches or *O. mykiss* redds. In that area the mainstem Ventura River flowed through the "new" channel (Figure 1), which terminated in a deep, wide pool nearly 1,000 ft in length. This long, levee-bordered pool may act as a sediment trap and could in part be responsible for the lower density of spawning gravels in the downstream channel.

Within substrate grid samples, the percentage of fines <2 mm in diameter from 100 grid tosses in the test reach averaged 13.2% (stdev=13.5), whereas the mean percentage of fines in 129 control reach grids was 9.8% (stdev=9.0). The median percentage of fines was identical at 8% in both reaches (Figure 3), and consequently the distribution of ranked values was not statistically different between the two reaches (Kolmogorov-Smirnov test statistic=0.1625), although the difference was nearly significant ($P$=0.08). When percentage fines was compared at the entire patch scale (e.g., using mean values from multiple grids/patch), the difference in fines between reaches was less apparent, with a mean value of 11.4% (stdev=10.6) in the test reach, and a mean of 10.1% (stdev=6.4) in the control reach (KS statistic=0.1852, $P$=0.75).

One possible explanation for the difference in mean percent fines between the two reaches could be the effects of the large pool trapping fines above the lower half of the control reach, as described above. A more likely explanation was the greater proportion of gravel patches observed in pool tails in the test reach versus the control reach. Seven of the 27 gravel patches assessed in the test reach occurred in pool tails, whereas only 1 of the 27 patches in the control reach was located in a pool habitat. The difference in the total surface area of gravel patches by habitat type is clearly evident in Figure 4, which shows that the test reach contained much more gravel in pool tails and less gravel in riffles than did the control reach. Gravel patches in pool tails occurred in slower velocities than did patches in run or riffle habitats, and consequently those patches tended to contain higher amounts of fines. This relationship is illustrated in Figure 5, which

shows the highest percentage of fines in pools, intermediate fines in glides, and lowest percentage of fines in runs and riffles.

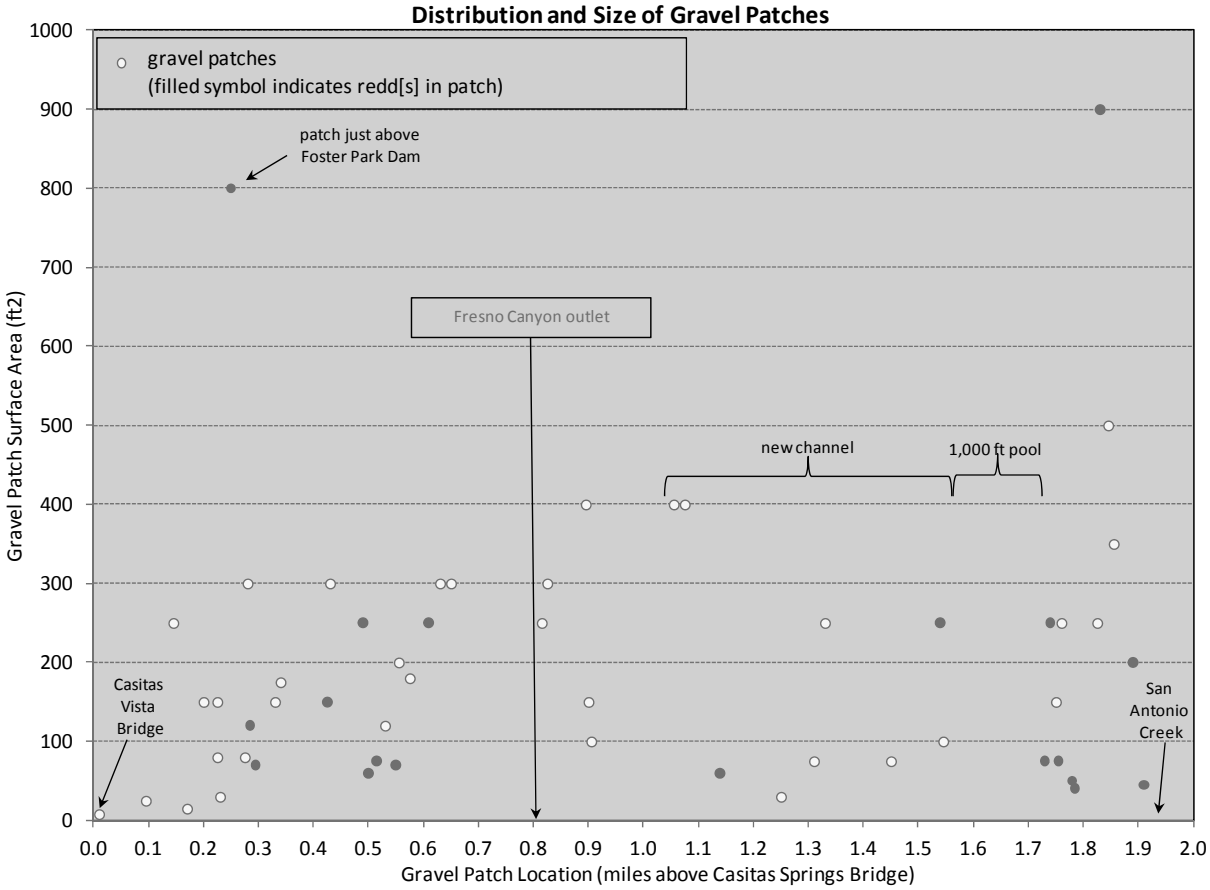



Figure 2. Relative location and size of spawning gravel patches assessed for percentage fines above and below the proposed Fresno Canyon outlet.

As previously noted, the differences in percentage fines between the two reaches may not be a very meaningful statistic in this pre-project analysis. Instead, it will be the relative change in percent fines in each reach as determined by post-project monitoring that will assess if project construction is responsible for recruitment of fines above what is seen in the control reach.

2. Assessing Substrate Particle Sizes on Open Bars

Pebble counts were conducted along ten transects were surveyed in each open bar reach, resulting in a total assessment of approximately 200 substrate particles per reach (Table 4). The frequency distribution shows, similar to the spawning gravel assessment, a greater proportion of fines in the test reach than in the upstream control reach (Figure 6). The test reach also contained a somewhat higher proportion of particles less than 45 mm in (maximum) size, whereas the control reach contained a higher proportion of particles >45 mm. Differences also occurred in the size of particles estimated by the D16, D50,

and D84 statistics, which represent the estimated sizes that represent the 16th , 50th (e.g., median), and 84th percentile in the ranked distribution of particles. Estimated particle sizes were smaller in the test reach than in the control reach for all three statistics (Table 5).

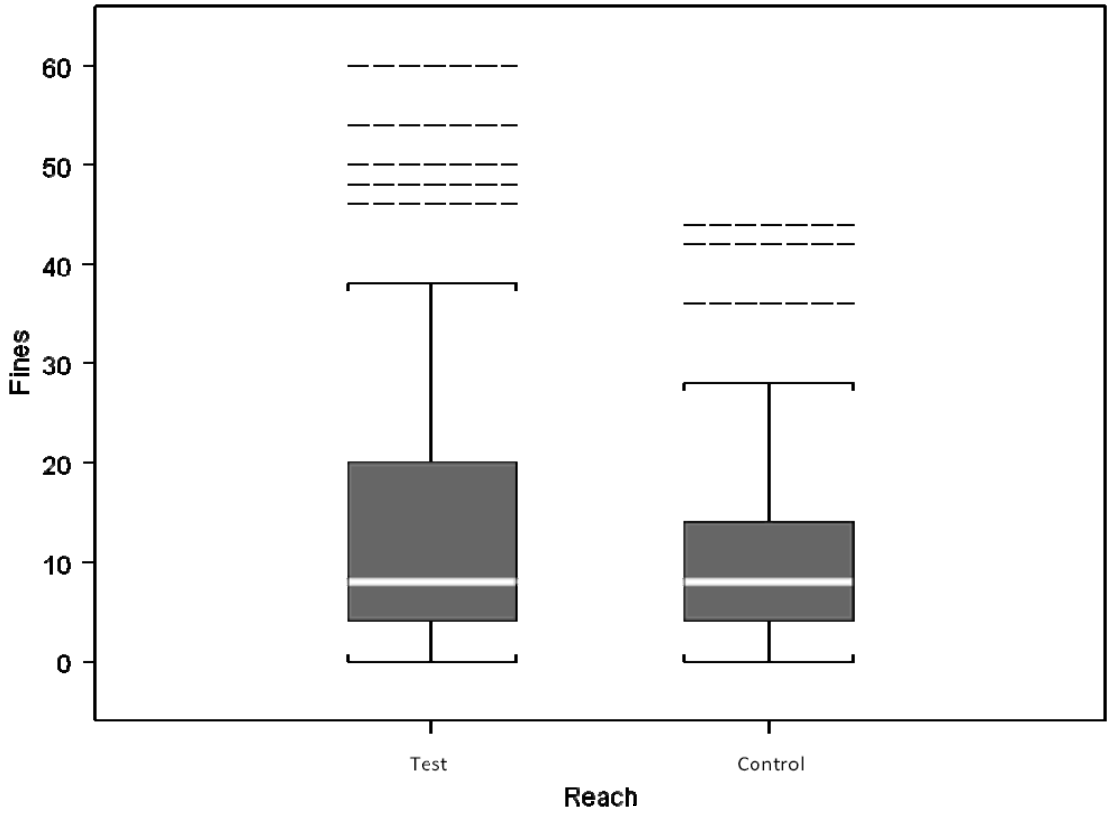



Figure 3. Percentage fines (<2 mm) in gravel patch grid samples by reach. Red boxes show quartiles, yellow lines show medians, whiskers show range with outliers as dashed lines.

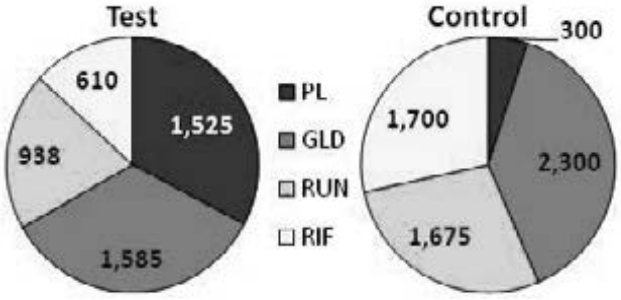



Figure 4. Surface area ($ft^2$) of spawning gravels in the mainstem Ventura River according to reach and habitat type.

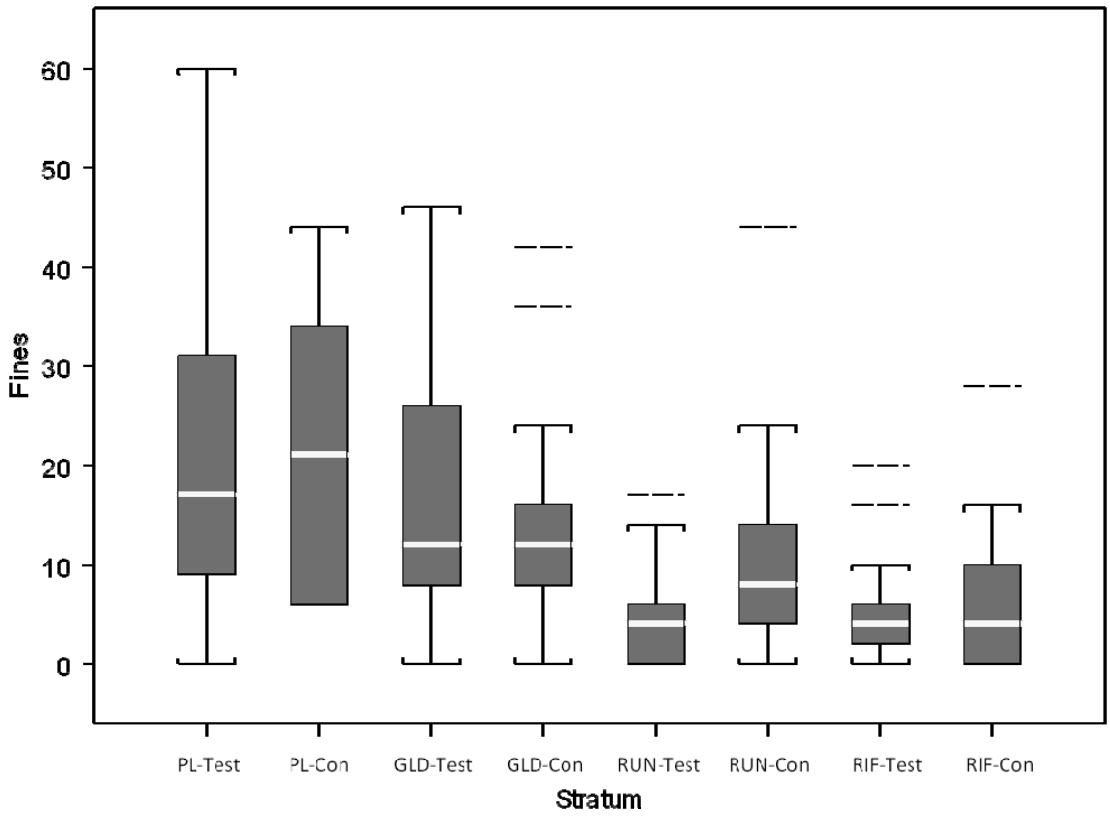



Figure 5. Percentage fines (<2 mm) in gravel patch grid samples according to habitat type (PL=pool, GLD=glide, RIF=riffle) and reach (Con=control). Red boxes show quartiles, yellow lines show medians, whiskers show range with outliers as dashed lines.

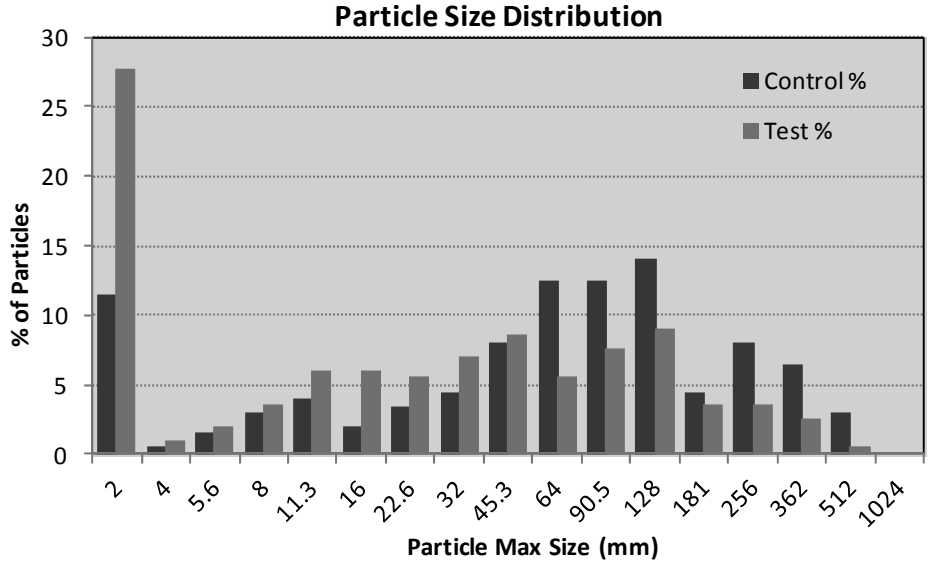



Figure 6. Particle size distribution from pebbles in test and control open bar reaches.

Table 4. Pebble count data from test and control open bar reaches.

| Class Name | Particle Size Class (mm) | Test Total | Control Total | Test Cumulative % | Control Cumulative % |
|---|---|---|---|---|---|
| Sand | <2 | 55 | 23 | 27.8 | 11.6 |
| VF Gravel | 2 - 4 | 2 | 1 | 28.8 | 12.1 |
| Fine Gravel | 4 - 5.6 | 4 | 3 | 30.8 | 13.6 |
| Fine Gravel | 5.6 - 8 | 7 | 6 | 34.3 | 16.6 |
| Med. Gravel | 8 - 11.3 | 12 | 8 | 40.4 | 20.6 |
| Med. Gravel | 11.3 - 16 | 12 | 4 | 46.5 | 22.6 |
| Coarse Gravel | 16 - 22.6 | 11 | 7 | 52.0 | 26.1 |
| Coarse Gravel | 22.6 - 32 | 14 | 9 | 59.1 | 30.7 |
| VC Gravel | 32 - 45.3 | 17 | 16 | 67.7 | 38.7 |
| VC Gravel | 45.3 - 64 | 11 | 25 | 73.2 | 51.3 |
| Sm. Cobble | 64 - 90.5 | 15 | 25 | 80.8 | 63.8 |
| Sm. Cobble | 90.5 - 128 | 18 | 28 | 89.9 | 77.9 |
| Lg. Cobble | 128 - 181 | 7 | 9 | 93.4 | 82.4 |
| Lg. Cobble | 181 - 256 | 7 | 16 | 97.0 | 90.5 |
| Sm. Boulder | 256 - 362 | 5 | 13 | 99.5 | 97.0 |
| Sm. Boulder | 362 - 512 | 1 | 6 | 100.0 | 100.0 |
| Med. Boulder | 512 - 1024 | 0 | 0 | 100.0 | 100.0 |
| Lg. Boulder | 1024 - 2048 | 0 | 0 | 100.0 | 100.0 |
| VL Boulder | 2048 - 4096 | 0 | 0 | 100.0 | 100.0 |
| Bedrock | >4096 | 0 | 0 | 100.0 | 100.0 |
| | Totals | 198 | 199 | | |

Table 5. Pebble count statistics from test and control open bar reaches.

| Particle Stat | Test | | Control | |
|---|---|---|---|---|
| | % | mm | % | mm |
| $D_{16}$ | 16.0 | 2.0 | 16.0 | 7.5 |
| $D_{50}$ | 50.0 | 21.0 | 50.0 | 63.0 |
| $D_{84}$ | 84.0 | 105.0 | 84.0 | 200.0 |

A statistical comparison of percentage fines, using both 2 mm and 4 mm to define fine sediments, resulted in highly significant differences between the test and control reaches, according to contingency tests (both *P*'s <0.0001).

The factors leading to higher percentage of fines and lower percentage of larger substrate particles in the test reach versus the control reach may be similar to those described above for spawning gravel fines. In particular, the test reach open bar encompassed a larger proportion of slow-water (pool and glide) habitat than did the control reach open bar, and pool or glide habitats are typically characterized by finer substrate materials than are run or riffle habitats. In the test reach open bar, three of the 10 transects traversed pool habitat and three traversed glides, with four transects crossing runs or riffles. In

contrast, 7 of 10 transects in the control reach open bar crossed runs and riffles, with only three transects across pools or glides.

Reanalysis of the pebble count data using only transects that traversed run or riffle habitats produced no statistical difference in the percentage of fines <2 mm or <4 mm between reaches (*P's*=0.22 and 0.14, respectively), however that analysis was based on a reduced sample size (79 and 124 particles in test and control samples) with reduced power to detect a true difference.

As previously stated under spawning area fines, these comparisons are only made to assess baseline conditions prior to project construction. Repeat analysis following project construction will be necessary to determine if project-related changes in pebble count statistics occur in the test reach differently than changes observed in the unaffected control reach.

3. Delineation of the Active Channel

The combination of gravel patch waypoints and the recording of the GPS tracklog in the control reaches old channel and new channel bifurcation produced a visible delineation of the active low flow channel during the March 2012 survey (Figure 1). As previously mentioned, the channel delineation revealed that the mainstem Ventura River did not flow against the eastern embankment in the vicinity of the proposed location of the new Fresno Canyon outlet.

4. Abundance of *O. mykiss* in Pool Habitats

Single-pass dive counts were conducted in 20 pools (10 per reach) at a flow of approximately 11 cfs with water temperatures ranging from 57-66$^{o}$F (14-19$^{o}$C) and underwater visibilities estimated at 7-11 ft (distance to identify a 2 inch fishing lure). Juvenile and/or adult *O. mykiss* were observed in 6 of 10 pools in the test reach, and in 7 of 10 pools sampled in the control reach (Table 6). Counts within individual pools ranged from zero to a maximum of nine *O. mykiss*, with total counts of 27 fish and 26 fish in the test and control reaches, respectively.

Eye-estimated fork lengths of *O. mykiss* ranged from approximately 10 cm to 50 cm (Figure 7), with the majority (91%) of observed *O. mykiss* 20 cm in length or larger. These fish lengths suggest that most *O. mykiss* were either adult fish of anadromous origin (e.g., ocean-run steelhead), or non-anadromous resident rainbow trout that reared to maturity within the Ventura River Basin. Smolt trapping data from the nearby Santa Clara River indicates that most (~70-90%) juvenile steelhead migrating downstream to the ocean are less than 20 cm in length (United Water 2007, 2008, 2009), and three years of trapping in San Luis Obispo Creek showed that 95% of April smolts were <20 cm (Normandeau, unpublished data). Also, dive counts in 2008-2011 have revealed that significant numbers of *O. mykiss* from 20-40 cm in length over-summer in the Casitas Springs reach of the Ventura River, which suggests that a significant presence of

Table 6. Pool habitat and dive count observation data.

| Reach | Pool No. | Pool Type | Length ft | Mean Width ft | Mean Depth ft | Maximum Depth ft | Surface Area $ft^2$ | Volume $ft^3$ | No. O. mykiss |
|---|---|---|---|---|---|---|---|---|---|
| Test | 1 | LSBk | 87 | 24.8 | 2.0 | 4.1 | 2,158 | 4,315 | 1 |
| | 2 | MCP | 93 | 38.2 | 1.7 | 2.9 | 3,553 | 6,039 | 0 |
| | 3 | LSBo | 57 | 31.7 | 1.4 | 2.4 | 1,807 | 2,530 | 0 |
| | 4 | PLP | 174 | 56.0 | 2.5 | 5.7 | 9,744 | 24,360 | 9 |
| | 5 | MCP | 170 | 42.3 | 1.6 | 2.7 | 7,191 | 11,506 | 4 |
| | 6 | LSRt | 135 | 30.2 | 1.6 | 3.7 | 4,077 | 6,523 | 8 |
| | 7 | LSRt | 48 | 21.0 | 2.3 | 4.5 | 1,008 | 2,318 | 4 |
| | 8 | MCP | 116 | 29.0 | 1.5 | 3.2 | 3,364 | 5,046 | 1 |
| | 9 | MCP | 165 | 32.0 | 1.2 | 2.4 | 5,280 | 6,336 | 0 |
| | 10 | MCP | 240 | 41.0 | 1.6 | 2.7 | 9,840 | 15,252 | 0 |
| Control | 1 | MCP | 270 | 35.5 | 2.0 | 4.5 | 9,585 | 19,170 | 0 |
| | 2 | LSBo | 300 | 37.8 | 1.8 | 4.2 | 11,340 | 20,412 | 1 |
| | 3 | MCP | 170 | 28.8 | 1.2 | 2.1 | 4,896 | 5,875 | 0 |
| | 4 | MCP | 78 | 38.3 | 0.7 | 1.2 | 2,987 | 2,091 | 0 |
| | 5 | LSRt | 130 | 28.8 | 2.2 | 3.5 | 3,744 | 8,237 | 1 |
| | 6 | LSBo | 976 | 76.2 | 3.6 | 7.0 | 74,371 | 267,736 | 2 |
| | 7 | DPL | 140 | 27.5 | 1.8 | 2.5 | 3,850 | 6,930 | 1 |
| | 8 | MCP | 174 | 33.3 | 1.8 | 3.8 | 5,794 | 10,430 | 8 |
| | 9 | CCP | 168 | 49.0 | 3.7 | 6.7 | 8,232 | 30,458 | 8 |
| | 10 | LSRt | 170 | 24.7 | 1.9 | 4.0 | 4,199 | 7,978 | 5 |

Pool Types:
LSBk lateral scour - bedrock (or concrete at Casitas Springs Bridge)
LSBo lateral scour - boulder
LSRt lateral scour - rootwad (may incl arundo clumps)
MCP midchannel
DPL dammed
PLP plunge
CCP channel confluence (at San Antonio Creek)

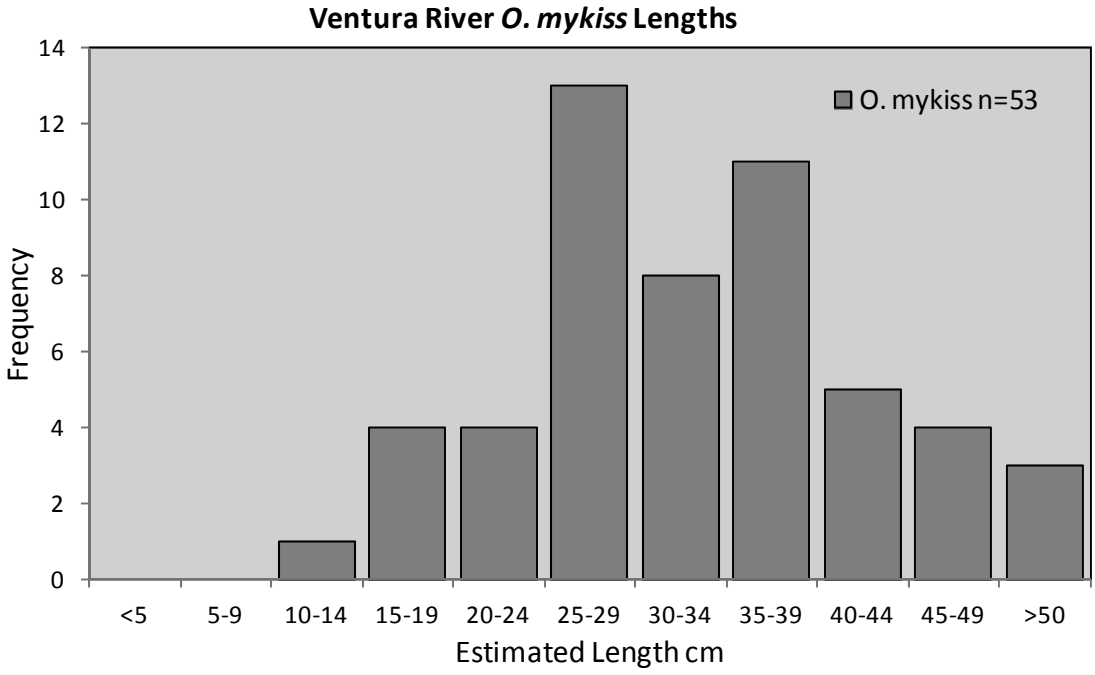



Figure 7. Eye-estimated fork lengths of *O. mykiss* in Ventura River pool habitats.

residualized, non-anadromous trout reside in the project area (TRPA 2009, 2009b, 2010, Normandeau 2011, 2011 unpublished data).

The relationships between pool dimensions and number of *O. mykiss* were generally weak, except for pool maximum depth which was clearly associated with *O. mykiss* dive counts when the 976 ft pool was excluded as an outlier (Figure 8). Although the long, levee-bordered pool typically contains an abundance of juvenile *O. mykiss* in the summer, only two large *O. mykiss* were observed in that pool during the March 2012 survey. Excluding that pool, the relationship between dive counts and maximum pool depth was highly significant ($R^2$=0.44, *P*=0.002). Only a single pool having a maximum depth over three feet did not contain any *O. mykiss* (Control #1, Table 6), however that same pool contained the largest number of juvenile and adult *O. mykiss* (18 fish) of seven pools sampled along Foster Park in September 2009 (TRPA 2009b). That particular pool also happened to be located immediately opposite the proposed location of the new Fresno Canyon outlet.

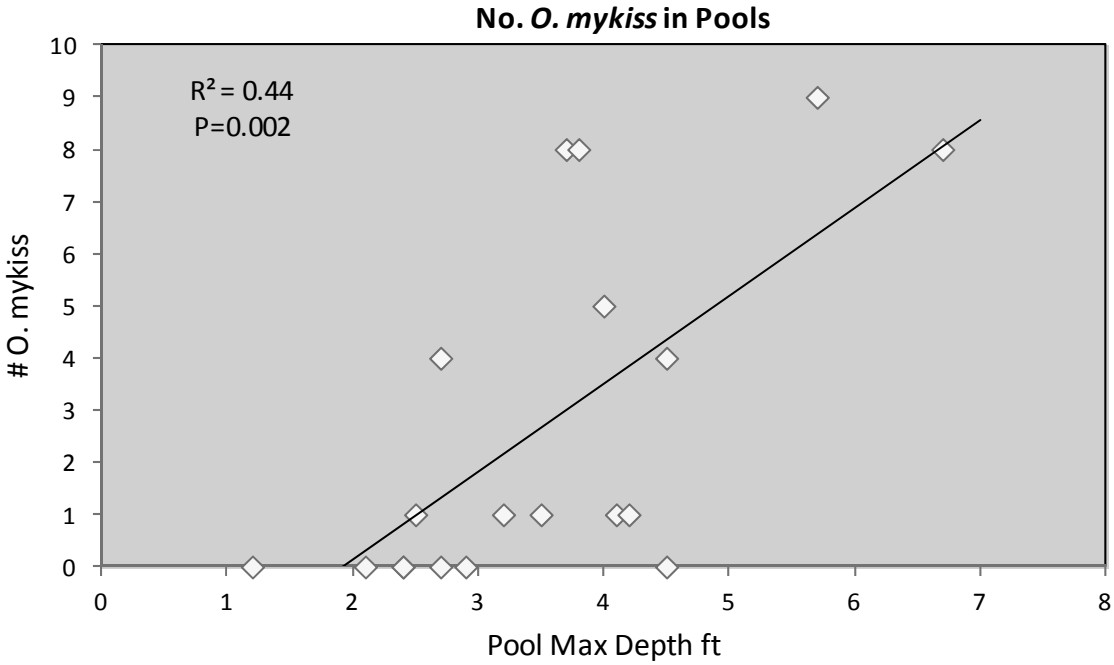



Figure 8. Relationship between pool maximum depth (ft) and dive count of *O. mykiss*.

In addition to pool depth, larger *O. mykiss* were clearly associated with some form of dense instream and overhead cover, such as instream Arundo branches, instream willow branches, and willow or Arundo root-masses.

## DISCUSSION

The abundance of suitable spawning gravel, *O. mykiss* redds, and large adult *O. mykiss* in the mainstem Ventura River immediately below the proposed location of the new Fresno Canyon outlet illustrates the importance of this reach in supporting the southern California steelhead DPS and its associated critical habitat. The density of spawning gravel and *O. mykiss* redds within the low-flow channel downstream of the Fresno

Canyon confluence may represent the highest density of gravel and spawning activity in any reach in the mainstem Ventura River.

Of the several potential impacts to southern steelhead or its habitat as a result of the proposed Fresno Canyon Flood Mitigation Project, the greatest potential threat may be the recruitment of fine sediments into the mainstem Ventura River. Other potential impacts include introduction of toxic chemicals into the river channel, removal of riparian vegetation, "capture" of the low flow channel along rip-rap armored streambanks, and alteration of the large pool adjacent to the proposed outlet.

Recruitment of Fine Sediments

An increase in fine sediments into the mainstem Ventura River downstream of the Fresno Canyon confluence can reduce *O. mykiss* spawning success by degrading gravel quality and subsequent egg survival (Phillips et al. 1975, Meehan and Swanston 1977, Young et al. 1990). Increased fine sediments can also impact rearing habitat by reducing invertebrate food production, by filling interstitial hiding spaces for *O. mykiss* fry, and by reducing pool depths that are clearly important to holding adult *O. mykiss* (Chapman 1988).

The spawning area grid samples and the open bar pebble counts revealed higher proportions of fine sediments in the test reach below the Fresno Canyon confluence than in the upper control reach, however those differences were largely due to the greater proportion of samples taken in slow-water pool and glide habitats in the test reach than in the control reach, where the majority of substrate samples were taken in swifter run and riffle habitats. Also, these study results represent a point-sample taken prior to project construction, where these differences in fine sediments (or any other parameter) between test and control reaches are meant to establish baseline conditions from which any future, post-construction changes can be assessed. Consequently, if post-construction monitoring of fine sediments shows an increase in fine sediments within spawning gravels or along open bar areas below the confluence that is significantly greater than changes observed in the upstream control reach, project-related impacts may be inferred to have occurred.

Project related increases in fine sediments are expected to be minimized by conducting the work during the summer dry season, when the Fresno Canyon channel is not flowing. Also, because the low flow channel of the Ventura River does not flow immediately adjacent to the eastern embankment where the new outlet will be constructed, direct contact with the mainstem Ventura River's low flow channel should not occur, with the possible exception of the graded outlet path that is intended to provide a clear, vegetation-free channel from the new outlet into the Ventura River floodplain. Consequently, recruitment of fine sediments due to project construction is mostly likely to occur the following winter season when fine sediments within the Fresno Canyon channel may be flushed into the Ventura River during storm events. The removal or stabilization of fine sediments within the Fresno Canyon channel is therefore critical to ensure that project-related fines are not recruited into the Ventura River. Construction-

related measures to capture, remove, or stabilize fines within the new Fresno Canyon outlet system are fully described in URS 2009.

Details regarding the graded path from the Fresno Canyon confluence into the Ventura River floodplain are not provided, except for a projected dimension of roughly 30 ft wide by 70 ft long (Hawks and Associates 2010). Subsequent discussions indicated that the length of the flow path will extend to an area of open channel rather than for a fixed distance of 70 ft (Masood Jilani, Ventura county Watershed Protection District, personal communication). This graded flow path has the potential to introduce fine sediments into the Ventura River, depending upon path location, direction, and path substrate characteristics. In addition, the path has the potential to impact an important pool habitat that is located immediately opposite the proposed outlet location (this issue is discussed below).

The actual distance between the site of the proposed Fresno Canyon outlet and the Ventura Rivers active channel was not measured due to thick riparian vegetation, but was approximated at roughly 250 ft based on distance between GPS waypoints and inspection of 2007 and 2009 aerial photographs. According to those images, an open, high water channel (dry during the March 2012 survey) exists approximately 150 ft out from the proposed outlet, and it is expected that the graded flow path would end at that point. This high flow channel is >100 ft from the 2012 low flow channel, and remains separate from the current low flow channel until the Foster Park diversion dam approximately 2,900 ft downstream. Consequently, given the current morphology of the low flow and high flow channels in the vicinity of the proposed outlet, and given that the graded flow path does not extend beyond this high flow channel, any sediments inadvertently introduced into the Ventura River floodplain might be expected to bypass the region of high spawning activity. Due to the uncertainty of this potential impact, the exact location and orientation of the graded flow path should be determined in consultation with terrestrial and aquatic biologists, with every effort taken to minimize the potential for the graded path to increase recruitment of fines into the mainstem Ventura River.

Introduction of Toxic Chemicals

Potentially toxic chemicals, such as diesel fuel, hydraulic fluid, concrete slurry, etc. will be used on-site and have the potential to be spilled into the Fresno Canyon or eastern edge of the Ventura River floodplain. Because the construction work is anticipated to occur during the dry season when surface flows are not present in Fresno Canyon, and because the low flow channel of the Ventura River is not anticipated to flow immediately adjacent to the proposed outlet location, direct contact with these chemicals with the Ventura River is not likely. However uncontained spills could enter the groundwater and affect water quality of the mainstem Ventura River. Consequently, the spill avoidance and containment procedures described in URS 2009 should be rigorously adhered to. In particular, construction of the graded flow path towards the Ventura River low flow channel should be monitored by qualified biologists to ensure that contact with the active channel is avoided.

Removal of Riparian Vegetation

The most recent project description used in this analysis (VCWPD 2012) suggests that construction of the outlet apron and the downstream rip-rap bank would require access for heavy equipment at the toe of the structure, and removal of riparian vegetation within the Ventura River floodplain extending approximately 25-40 ft out from the eastern embankment. Vegetation mapping conducted during initial design analyses (Hawks and Associates 2010) indicated that oak, walnut, sycamore, or any large heritage trees did not occur in the immediate vicinity of the outlet structure or the graded flow path. Consequently, it is expected that riparian-related impacts will be restricted to smaller shrubs and non-heritage tree species that dominate the Ventura River floodplain.

Because at the time of this survey (spring 2012) the low flow channel of the Ventura River did not flow immediately adjacent to the eastern embankment at the project location, removal of critical vegetation that provides either shade, food input, or bank stability to the low flow channel is not anticipated, however vegetation along the eastern embankment that provides refuge shelter during periods of high flow will be impacted. Due to the abundance of thick riparian vegetation currently within the Ventura River floodplain at the project location, the temporary removal of some high flow refuge habitat is not expected to significantly affect survival of *O. mykiss* during periods of high flow. As discussed below, the potential impacts of riparian removal on *O. mykiss* habitat would be magnified if the active channel of the Ventura River migrated to the eastern embankment, where most of the project related habitat alterations will occur.

Currently, the primary potential impact associated with riparian removal is likely associated with the proposed graded flow path. Depending upon the direction and orientation of the graded flow path, this project component has the potential to impact riparian vegetation and the quality of aquatic habitat (and associated *O. mykiss*) within the low flow channel. As stated above, the graded flow path is not expected to extend to the currently active channel; however the path should be carefully designed and routed in consultation with terrestrial and aquatic biologists in order to minimize effects of sedimentation or riparian impacts to the mainstem Ventura River.

Capture of the Active (Low Flow) Channel

The mapped locations of each identified gravel patch in the test and control reaches, and the delineation of the "old" channel in the control reach, clearly showed that the active, low flow channel of the Ventura River did not flow immediately along the eastern embankment in the vicinity of the proposed Fresno Canyon outlet (Figure 1) in March 2012. The Ventura River channel did meet the eastern embankment at the bottom of Foster Park, roughly 3,700 ft downstream of Fresno Canyon, and also the "old" channel (containing approximately 10% of total flow) did flow along the County levee in the control reach approximately 2,000 ft upstream of the project site. Currently, the active channel was estimated to occur approximately 250 ft opposite the proposed Fresno Canyon outlet. However the dynamic nature of the Ventura River channel in the relatively wide and unconfined floodplain results in frequent shifts in the active channel,

such as illustrated by the recent change from the "old" to the "new" channel in the control reach during the winter-spring of 2010-2011.

High flow events during the next several wet seasons could result in a new shift in the active channel and could result in greater contact between the active, low flow channel and the eastern embankment in the vicinity of Fresno Canyon. The alternatives currently under consideration call for an outlet structure with a rip-rap apron approximately 120 ft in width, with approximately 40 ft of rip-rap bank protection downstream of the new outlet. At this point it is uncertain if the existing, "semi-natural" rip-rap embankment located on the upstream (northern) edge of the outlet will be strengthened or left in its current, vegetated state.

Because of the dynamic nature of the Ventura Rivers active channel within the floodplain, and because "hard" structure such as rip-rap boulders, retaining walls, etc, may result in local scour, it is possible that the active channel could migrate to the eastern bank in the vicinity of the proposed outlet. Although the outlet structure and downstream bank protection is only expected to extend about 160 linear ft along the Ventura River's high flow streambank, the design could result in degraded instream habitat if the low flow channel is captured along the eastern bank.

For example, prior to 2011 the "old" channel in the control reach was the active low flow channel and for much of its length it bordered the County levee (Figure 1). In that area the aquatic habitat was very shallow, wide, and homogenous and consistently contained low abundance of *O. mykiss* (TRPA 2007, 2008, 2009, Normandeau 2011). In contrast, farther upstream the Ventura River currently flows adjacent to the County levee between miles 1.7-1.8 (Figure 2), where large gravel deposits support heavy spawning activity. Also, large numbers of juvenile *O. mykiss* have been observed in several deep, rip-rap bordered pools within both the test and the control reaches. Thus, capture of the low flow channel in the vicinity of the proposed outlet *could* result in suitable rearing or spawning habitat.

Alteration of a Major Rearing Pool

Immediately opposite the proposed Fresno Canyon outlet is a long (270 ft) and deep (4.5 ft) pool containing approximately 300 $ft^2$ of potential spawning gravel (pool Control #1, Table 6). Although this pool did not contain any *O. mykiss* during the March 2012 survey, in September 2009 this pool contained the highest number (18) of *O. mykiss* of any pools in the Foster Park area (TRPA 2009). Because the exact distance from the pool to the proposed outlet was not determined (but estimated at 250 ft), and because specific details regarding the location and extent of the graded flow path were not available, it is uncertain if the graded flow path would be expected to affect this pool. However as stated above, the expectation is that the graded flow path would only extend into the first open bar area approximately 150 ft into the Ventura River floodplain, which should ensure a wide buffer ($\geq$100 ft) of undisturbed habitat between the disturbed area and the current low flow channel.

Given the large size and depth of this pool and its importance to rearing *O. mykiss* through the summer low flow season, effort should be taken to avoid directing the outflow of the new Fresno Canyon outlet, or the grading of the flow path, directly towards this pool. Instead, the graded flow path should be directed into the high flow channel well short of the pool.

## CONCLUSIONS

The mainstem Ventura River upstream and downstream of the proposed Fresno Canyon outlet contains abundant spawning gravels that, in March 2012, were subject to heavy spawning activity by adult *O. mykiss*. Most pools in the vicinity of the project area also contained one or more adult *O. mykiss* of either anadromous (a.k.a., steelhead) or resident (a.k.a., rainbow trout) origin, however distinction between the two life history forms could not be determined visually. Most adult *O. mykiss* occurred in pools with maximum depths over three ft, and were most often observed holding underneath dense instream vegetation, such as Arundo or willow branches or roots. Most spawning gravels in both test and control reaches contained less than 20% fines (particles <2 mm in diameter), with a higher mean percentage of fines in gravel patches downstream of the proposed Fresno Canyon outlet (13.2%) versus upstream of the outlet (9.8%). However, median values were 8% in both reaches and the difference in ranked values was not statistically significant. Pebble counts conducted across instream and out-of-water open cobble bars located both upstream and downstream of the Fresno Canyon outlet also showed a higher percentage of fines in the downstream reach, where the difference was statistically significant.

Differences in substrate characteristics or fish abundance between test and control reaches in this pre-project assessment are intended to represent baseline conditions existing in the mainstem Ventura River during a single point in time prior to project construction. A post-project assessment utilizing the same survey protocols is therefore necessary to assess any construction-related impacts to downstream substrate characteristics or *O. mykiss* abundance. For example, if post-construction monitoring of fine sediments shows an increase in fine sediments within spawning gravels or along open bar areas below the confluence that is significantly greater than concurrent changes observed in the upstream control reach, project-related impacts may be inferred to have occurred. This assessment therefore assumes that the test and control reaches are similarly affected by sediment inputs, with the only exception being the presence of Fresno Canyon.

Several factors may complicate this assumption. First, only a single year of pre-project data (this report) is currently available to document baselines conditions, and data will not be available to determine if pre-project changes in percentage fines occurs equally in both the test and control reaches. A second year of pre-project data collection (in March 2013) would help to validate this assumption. Secondly, because deposition of fines from a point source (e.g., a tributary confluence) would be expected to be heaviest nearer the point source and less evident farther downstream, the presence of San Antonio Creek at the upper end of the control reach could elevate fines solely within the control reach,

which could therefore mask any potential deposition of sediments from the Fresno Canyon project (e.g., both reaches could show equal increases in sediment, but from different sources). Unfortunately, the control reach between the Fresno Canyon and San Antonio Creek confluences was the only location having similar streamflow, aquatic habitat, and riparian characteristics as the test reach immediately downstream of Fresno Canyon.

Several factors are expected to reduce or minimize potential impacts due to project construction: 1) construction is intended to occur during the dry season when the Fresno Canyon channel is dry and no surface water is flowing into the Ventura River; 2) new bank armoring at and downstream of the outlet are limited in extent (at roughly 160 linear ft); and 3) the active channel of the Ventura River currently does not flow along the eastern embankment where project construction will occur. Given adequate erosion control measures and removal or stabilization of construction-related fine sediments (URS 2009), given careful alignment of the graded flow path away from the adjacent rearing pool, and given successful re-establishment of riparian vegetation below the downstream bank protection, the Fresno Canyon Flood Mitigation Project should be capable of reducing flooding of the Casitas Springs community and Highway 33 without producing significant short-term or long-term impacts to spawning or rearing *O. mykiss* or its critical habitat within the Ventura River.

## LITERATURE CITED

Bunte, K., S.R. Abt, J.P. Potyondy, and K.W. Swingle. 2009. Comparison of three pebble count protocols (EMAP, PIBO, and SFT) in two mountain gravel-bed streams. Journal of the American Water Resources Association 45:1209-1227.

Capelli, M.H. 1997. Ventura River steelhead survey, Ventura County, California. California Department of Fish and Game, Region 5.

Chapman, D.W. 1988. Critical review of variables used to define effects of fines in redds of large salmonids. Transactions of the American Fisheries Society 117:1-21.

Hawks and Associates. 2010. Foster Park Embankment Protection and Restoration and the Fresno Canyon Flood Mitigation Projects: Alternatives analysis near the proposed Fresno Canyon Outlet. Final Memorandum dated June 18th, 2010.

Marcus, M.D., M.K. Young, L.E. Noel, and B.A. Mullan. 1990. Salmonid-habitat relationships in the western United States: a review and indexed bibliography. United States Forest Service, Pacific Rocky Mountain Forest and Range Experiment Station General Technical Report RM-188. Fort Collins, Colorado. 84pp.

Meehan, W.R., and D.N. Swanston. 1977. Effects of gravel morphology on fine sediment accumulation and survival of incubating salmon eggs. USDA, Forest Service Research Paper PNW-220. Pacific Northwest Forest and Range Experiment Station, Portland, OR. 16p.

Moore, M.R. 1980. Factors influencing the survival of juvenile steelhead rainbow trout (*Salmo gairdneri gairdneri*) in the Ventura River, California. M.S. Thesis, Humboldt State University, Arcata, California. 82 pp.

Normandeau Associates. 2011. Steelhead population assessment in the Ventura River/Matilija Creek Basin. 2010 Data Summary. Report by Mark Allen, Tim

Salamunovich, and Tom Gast for Surfrider Foundation and the California Department of Fish & Game. 35 pp.

NMFS (National Marine Fisheries Service). 2005. *Endangered and Threatened Species; Designation of Critical Habitat for 7 Evolutionary Significant Units of Pacific Salmon and Steelhead in California; Final Rule*.

NMFS (National Marine Fisheries Service). 2006. *Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead; Final Rule.*

Phillips, R.W., R.L. Lantz, E.W. Claire, and J.R. Moring. 1975. Some effects of gravel mixtures on emergence of coho salmon and steelhead trout fry. Transactions of the American Fisheries Society 104:461-466.

Potyondy, J.P., and K. Bunte. 2002. Analyzing pebble count data collected by size classes. Free excel analysis program, version 1.0a. Accessed April 2012 at http://www.stream.fs.fed.us/publications/software.html.

Thomas R. Payne & Associates. 2007. Steelhead population and habitat assessment in the Ventura River/Matilija Creek Basin. 2006 Final Report by Mark Allen, Scott Riley, and Tom Gast to the Ventura County Flood Control District, Ventura, CA. 87 pp.

Thomas R. Payne & Associates. 2008. Steelhead population and habitat assessment in the Ventura River/Matilija Creek Basin. 2007 Final Report by Mark Allen to the Ventura County Flood Control District, Ventura, CA. 68 pp.

Thomas R. Payne & Associates. 2009. Steelhead population assessment in the Ventura River/Matilija Creek Basin. 2008 Summary Report, submitted to Ventura County Flood Control District, California Department of Fish & Game, Matilija Coalition, and Patagonia, Inc. 30 pp.

Thomas R. Payne & Associates. 2009b. Assessment of habitat quality and potential enhancement for steelhead in the Ventura River in association with the Foster Park Embankment Protection and Restoration Project. Report by Mark Allen to Impact Sciences, Pasadena, CA. 25 pp.

Thomas R. Payne & Associates. 2010. Steelhead population assessment in the Ventura River/Matilija Creek Basin. 2009 Data Summary. Report submitted to Matilija Coalition, Surfrider Foundation, and Patagonia, Inc. 15 pp.

United Water. 2007. Fish passage monitoring and studies, Vern Freeman Diversion Facilities, Santa Clara River. Annual report 2007 monitoring season. United Water Conservation District, Santa Paula, CA.

United Water. 2008. Fish passage monitoring and studies, Vern Freeman Diversion Facilities, Santa Clara River. Annual report 2008 monitoring season. United Water Conservation District, Santa Paula, CA.

United Water. 2009. Fish passage monitoring and studies, Vern Freeman Diversion Facilities, Santa Clara River, Ventura county, California. Annual report 2009 monitoring season. United Water Conservation District, Santa Paula, CA.

USFS. 1995. Draft R5 SCI Protocols, Version 3.0. United States Forest Service, Region 5, Vallejo, California.

URS Group, Inc. 2009. Fresno Canyon flood mitigation, Ventura County Watershed Protection District. Draft Biological Assessment PDMC-PJ-09-CA-2007-013 to Federal Emergency Management Agency. Oakland, CA.

Ventura County Watershed Protection District (VCWPD). 2012. Fresno Canyon Flood Mitigation Project (No. 81182). Draft project description, dated September 9 2012.

Young, M.K., W.A. Hubert, and T.A. Wesche. 1990. Fines in redds of large salmonids. Transactions of the American Fisheries Society 119:156-162.

# APPENDIX 6

## Biological Opinion on the Fresno Canyon Flood Mitigation Project

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
81440-2009F-0490

January 6, 2010

Alessandro Amaglio
Regional Environmental Officer
U.S. Department of Homeland Security
1111 Broadway, Suite 1200
Oakland, California 94607-4052

Subject: Biological Opinion on the Fresno Canyon Flood Mitigation Project, Ventura County, California (PDM-PJ-09-CA-2007-013) (CON 8-8-09-F-60)

Dear Mr. Amaglio:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed funding by the Federal Emergency Management Agency (FEMA) of the Fresno Canyon Flood Mitigation Project (the Project) and its effects on the federally threatened California red-legged frog (*Rana aurora draytonii*) and the endangered least Bell's vireo (*Vireo bellii pusillus*) and southwestern willow flycatcher (*Empidonax traillii extimus*), in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 et seq.). Your September 8, 2009, request for formal consultation was received on September 10, 2009.

This biological opinion is based on information which accompanied your September 8, 2009, request for consultation, including the biological assessment (FEMA 2009), permit application (Ventura Public Works 2009), and information from our files. A complete administrative record of this consultation is available at the Ventura Fish and Wildlife Office.

## BIOLOGICAL OPINION

### DESCRIPTION OF THE PROPOSED ACTION

FEMA has proposed to provide Pre-Disaster Mitigation Program federal financial assistance (PDM-PJ-09-CA-2007-13) to the Ventura County Watershed Protection District (District) for the Fresno Canyon Flood Mitigation Project. The project would involve construction of a flood-control facility to transport water, sediment, and debris from Fresno Canyon to the Ventura River to reduce the risk of flooding in the community of Casitas Springs, Ventura County, California. The project area encompasses a portion of the Ventura River bank, Fresno Canyon Creek and

associated uplands, extending approximately 1,400 feet upstream of the Ventura River. State Highway 33 crosses Fresno Canyon Creek in the project area.

Construction and Maintenance

The proposed project would have a construction component and regular maintenance. The construction phase would require considerable grading and ground disturbance. Trenches up to 70 feet wide, 30 feet deep and 400 feet long would be dug, with 14,400 cubic yards of excavation and 14,900 cubic yards of backfill. Two maintenance and access road would be established outside of the manufactured channel, and some adjacent slopes would be excavated and shored to prevent collapse into the new channel. In general, the entire portion of Fresno Creek within the project area would be conveyed in box culverts or other man-made structures to convey all of the flows that could result from a 100-year rainfall event. Equipment would be staged in previously disturbed areas. Water diversion would be required for initial construction. Maintenance of the channel would be required following construction. If monitoring shows debris and/or sediment is potentially blocking the channel, it would be removed by accessing the channel from the upstream entrance. Some repair of the facilities may be required as wear and tear occurs.

Avoidance and Minimization Measures

The applicant proposes to implement the following measures to minimize adverse effects to the California red-legged frog, least Bell's vireos, and southwestern willow flycatcher. These are taken directly from the biological assessment (FEMA 2009) and except for some style changes, are cited verbatim from that document:

**California red-legged frog**

1. Work in the Ventura River will be limited to the period outside of the California red-legged frog breeding and bird nesting seasons. The construction window would be August 31 through October 31.

2. A qualified biologist will conduct pre-construction surveys at least 2 days prior to start of construction activities in areas where ground disturbance would occur to determine whether California red-legged frogs are present. If California red-legged frogs are found during any preconstruction surveys, the biologist will contact the Service to determine whether moving them is appropriate. If the Service gives approval for relocation, the Service-approved biologist will be allowed sufficient time to move the California red-legged frogs from the work site before activities begin.

3. A Service-approved biologist will monitor construction activities that involve retaining wall construction and installation of rock slope protection along the Ventura River channel bank. If California red-legged frogs are found that are likely to be killed or injured by work activities, the Service-approved biologist will be allowed sufficient time

to move them from the site before work activities resume. The Service-approved biologist will relocate the California red-legged frogs the shortest distance possible to suitable habitat that will not be affected by activities associated with the proposed project. Only California red-legged frogs that are at risk of injury or death by project activities will be moved.

4. Only Service-approved biologists will participate in activities associated with capture, handling, and monitoring of California red-legged frogs. The District will request and receive Service approval of any other biologist whom the agency wishes to conduct activities with California red-legged frogs.

5. If more than two California red-legged frogs are found dead or injured as a result of project activities within a 12-month period, the District will contact the Service immediately so the Service can review the project activities to determine whether additional protective measures are needed.

6. Exclusion fences composed of silt fence material will be installed at the margins of the work area to prevent workers from encroaching into adjacent habitat and to prevent California red-legged frogs from entering the construction area. A fine mesh (less than 0.40 inch) will be used to avoid entrapment of amphibians in the silt fence. The silt fence will be monitored periodically during construction to evaluate its effectiveness. All fencing in this area will be maintained for the duration of construction and removed on project completion.

7. To avoid attracting predators, food-related trash will be kept in closed containers and removed regularly from the project area.

8. To avoid transferring disease or pathogens, the Service-approved biologist will follow the Declining Amphibian Populations Task Force Fieldwork Code of Practice (attached).

9. Prior to construction, a qualified biologist will conduct training sessions to familiarize all construction personnel with the following: identification of California red-legged frogs, their habitat, general provisions and protections afforded by the Act, measures implemented to protect the species for this project, and a review of the project boundaries. This training will also be provided within 30 days of the arrival of any new worker.

10. If an injured California red-legged frog is found, the Service-approved biologist will determine the extent of the injury. If the injury is minor and the frog is likely to survive without treatment, the biologist will document the injury and release the frog in an appropriate location previously designated by the Service; however, if the injured frog requires professional treatment to survive, the biologist will transport the frog to the location where a qualified professional can provide the needed treatment. The location of a qualified professional to assist the frog will have been documented prior to the start of

construction. The treated frog will be released at an appropriate location as soon as its recovery allows. Within three working days, the injured frog incident will be reported to the Service and reported information will include date of injury, extent of injury, and action(s) taken. If a frog dies while being treated or a dead frog is located in the project area, the Service will be contacted within three working days. At that time, the Service will provide instructions regarding the deposition of the frog.

11. The District will provide the Service with a report on the results of biological surveys and sighting records and also document the following: the number of California red-legged frogs relocated from the project area or killed or injured during the proposed project; the dates and times of capture, mortality, or injury; specific locations of capture, mortality, or injury; approximate size and age of individuals; and a description of relocation sites.

12. All areas subject to temporary disturbance will be restored onsite with native riparian species to pre-project conditions upon completion of construction.

13. The District will take measures to prevent the introduction of invasive weeds at the construction site. This will include cleaning all equipment before bringing it onsite and using only certified, weed-free erosion control and revegetation materials.

The District will implement the following measures to prevent erosion, sedimentation, potential spills, and pollution:

14. Standard Best Management Practices and erosion control measures will be implemented during construction to minimize possible discharge of sediment into aquatic habitats. These measures will include, but will not be not limited to, installing and maintaining silt fences immediately down gradient of disturbed areas.

15. Erosion control and sediment detention devices (e.g., well-anchored sandbag cofferdams, straw bales, or silt fences) will be incorporated into the project design and implemented at the time of construction. These devices will be in place during construction activities, and after if necessary, for the purposes of minimizing fine sediment and sediment/water slurry input to flowing water and of detaining sediment laden water onsite. These devices will be placed at all locations where the likelihood of sediment input exists. Supply of erosion control materials will be kept on hand to cover small sites that may become bare and to respond to sediment emergencies.

16. The District will inspect the performance of sediment control devices at least once each day during construction to ensure that the devices are functioning properly. If a control measure is not functioning effectively, the control measure will be immediately repaired or replaced. Additional controls will be installed as necessary.

17. Sediment will be removed from sediment controls once the sediment has reached 1/3 of the exposed height of the control. Sediment collected in these devices will be disposed of away from the collection site at approved disposal sites.

18. All disturbed soils at each site will undergo erosion control treatment after construction is terminated. Treatment includes seeding and sterile mulch. Any disturbed soils on a gradient of more than 30 percent will have erosion control blankets installed.

19. Any stockpiles of soil used for fill material during construction will be covered with a tarp or erosion control blanket, and silt fences will be installed appropriately to contain soils from moving into area waterways. If the local weather forecast indicates there is greater than a 50 percent chance of rain, the project site will be "rain-proofed" with erosion control measures so that no sediment or turbidity enters the stream from the project footprint.

20. All debris, sediment, rubbish, vegetation, or other material removed from the channel banks, channel bottom, or sediment basins will be disposed of at an approved disposal site. All petroleum products, chemicals, silt, fine soils, and any substance or material deleterious to listed species will not be allowed to pass into, or be placed where it can pass into, the stream channel. No material will be sidecast into any waterway.

21. The District will exercise every reasonable precaution to protect the Ventura River from pollution with fuels, oils, bitumens, calcium chloride, and other harmful materials.

22. Construction by-products and pollutants such as petroleum products, chemicals, fresh cement, or deleterious materials will not be allowed to discharge into the Ventura River and will be collected and transported to an authorized disposal area.

23. A plan for the emergency clean-up of any spills of fuel or other material will be available onsite during construction activities.

24. Equipment will be refueled and serviced at designated construction staging areas. All construction material and fill will be stored and contained in a designated area that is located away from channel areas to prevent transport of materials into adjacent streams. A silt fence will be installed to collect any discharge, and adequate materials for spill cleanup will be maintained onsite.

25. Construction vehicles and equipment will be maintained to prevent contamination of soil or water (from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease).

26. Good housekeeping practices and use of safer alternative products, such as biodegradable hydraulic fluids, will be used to the extent feasible.

27. An employee training program will be implemented. Employees will be trained to prevent or reduce the discharge of pollutants from construction activities to waters and of the appropriate measures to take if a spill occurs.

28. In the event of a spill, work will stop immediately, spill control will be implemented, and the Service will be notified.

**Least Bell's Vireo and Southwestern Willow Flycatcher**

This section describes the avoidance and minimization measures necessary to protect the least Bell's vireo and southwestern willow flycatcher and their habitat.

29. To reduce adverse effects to the least Bell's vireo and southwestern willow flycatcher, the District will perform all construction activities in the Ventura River bed and bank outside of their nesting season (all construction activities east of State Route (SR) 33 may occur year round as SR33 presents a noise barrier from the river). Typically, construction activities would take place outside of the least Bell's vireo's nesting season, which extends from mid-March through late September, and the southwestern willow flycatcher's nesting season, which extends from mid-May through late August; however, because the Ventura River may also provide habitat to support federally listed anadromous fish species under the National Marine Fisheries Service's jurisdiction (in-water work window is June 15 through November 1), as well as the federally listed California red-legged frog under Service jurisdiction, the work window for construction activities near the Ventura River bed and bank has been modified to August 31 to October 31 as long as the following two measures are also implemented.

    a. A qualified biologist will conduct preconstruction surveys of all ground disturbance areas within riparian habitats to determine if least Bell's vireos and/or southwestern willow flycatchers are present prior to the start of construction. These surveys will be completed within 2 weeks prior to start of construction activities in the riparian zone. If least Bell's vireos and/or southwestern willow flycatchers are found nesting in the riparian zone during any preconstruction surveys, the qualified biologist will have stop work authority and stop construction activities in that area. Work activities would resume when the chicks have fledged and left the nest.

    b. A 250-foot buffer would be maintained around the riparian zone during the month of September if any least Bell's vireos are present. After September, no buffer would be applied because least Bell's vireo would have migrated out of the area by then. Any southwestern willow flycatchers would have left the area in late August.

**Measures to Avoid and Minimize Effects to California Red-legged Frog, Least Bell's Vireo, and Southwest Willow Flycatcher**

As discussed above, the proposed project has the potential to adversely affect suitable riparian habitat for the California red-legged frog and suitable nesting habitat for the least Bell's vireo and southwestern willow flycatcher. The riparian zone along the Ventura River bed and banks is considered suitable riparian habitat for the California red-legged frog and suitable nesting habitat for the least Bell's vireo and southwestern willow flycatcher and will therefore be protected. The following measures will be taken to avoid and minimize the potential adverse effects on habitat for these three federally listed species.

30. Disturbance to existing grades and vegetation will be limited to the actual site of the project and necessary access routes. Placement of all roads, staging areas, and other facilities will avoid and limit disturbance to streambank or stream channel habitat as much as possible. When possible, existing ingress or egress points will be used and the contours of the project area will be returned to pre-construction condition or better.

31. The District will, to the maximum extent practicable, reduce the amount of disturbance at a site to the absolute minimum necessary to accomplish the project. Whenever practicable, existing vegetation would be salvaged from the footprint of the project area and stored for replanting after earthmoving activities are completed.

32. The Dsitrict will restore the riparian habitat permanently lost at the outlet location during project construction project area through planting willows and other riparian species within the Ventura River's riparian zone in areas adjacent to the project area. Native willow species would be used for revegetation efforts. These revegetation efforts will be implemented at up to 3 to 1 ratio followed by a 5-year monitoring period to reach an 80 percent native species cover success criterion.

33. The District will take measures to prevent the introduction of invasive weeds at the construction site, including cleaning all equipment before bringing it onsite and using only certified weed-free erosion control and revegetation materials."

ANALYTICAL FRAMEWORK FOR THE JEOPARDY DETERMINATIONS

The jeopardy analyses in this biological opinion rely on four components: (1) the Status of the Species, which evaluates the range-wide condition of the California red-legged frog, least Bell's vireo, and southwestern willow flycatcher, the factors responsible for that condition, and their survival and recovery needs; (2) the Environmental Baseline, which evaluates the condition of the species in the action area, the factors responsible for those conditions, and the relationship of the action area to the survival and recovery of the three species; (3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the California red-legged frog, least Bell's

vireo, and southwestern willow flycatcher; and (4) the Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on the species.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed federal action in the context of the current status of the species, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the California red-legged frog, least Bell's vireo, or southwestern willow flycatcher in the wild.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the California red-legged frog, least Bell's vireo, and southwestern willow flycatcher, and the role of the action area in the survival and recovery of these species as the context for evaluation of the significance of the effects of the proposed federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

## STATUS OF THE SPECIES

### California red-legged frog

The California red-legged frog was federally listed as threatened on May 23, 1996 (61 FR 25813), and critical habitat was designated for the subspecies on April 13, 2006 (71 FR 19244). The Service completed a recovery plan for the subspecies in 2002 (Service 2002). Critical habitat for the California red-legged frog was first designated on March 13, 2001 (66 FR 14625). On November 6, 2002, the U.S. District Court for the District of Columbia set aside the designation and ordered the Service to publish a new final rule with respect to the designation of critical habitat for the California red-legged frog (*Home Builders Association of Northern California et al. versus Gale A Norton, Secretary of the Department of Interior et al.* Civil Action No. 01-1291 (RJL) U.S. District Court, District of Columbia.). The Service published a new proposed rule to designate critical habitat for the California red-legged frog on April 13, 2004 (69 FR 19620). Critical habitat for the California red-legged frog was re-designated on April 13, 2006 (71 FR 19244). On September 16, 2008, the Service proposed a new, revised rule to designate 1.8 million acres as critical habitat for the California red-legged frog, an area that is 300 percent larger than the 2006 designation for the subspecies (73 FR 53492). The Fresno Canyon project site is not within designated or proposed critical habitat and it will not be discussed further.

The California red-legged frog uses a variety of habitat types, including various aquatic systems, riparian, and upland habitats. The diet of California red-legged frogs is highly variable. Tadpoles eat algae and a variety of other items found on the bottom of the waterbody they inhabit (Jennings et al. 1992). Hayes and Tennant (1985) found invertebrates to be the most common food item of adults. Vertebrates, such as Pacific treefrogs (*Hyla regilla*) and California mice (*Peromyscus californicus*), represented over half of the prey mass eaten by larger frogs (Hayes and Tennant 1985). Feeding activity probably occurs along the shoreline and on the

surface of the water. Hayes and Tennant (1985) found juveniles to be active diurnally and nocturnally, whereas adults were largely nocturnal.

California red-legged frogs breed from November through March; earlier breeding has been recorded in southern localities (Storer 1925). Males appear at breeding sites from 2 to 4 weeks before females (Storer 1925). California red-legged frogs are often prolific breeders, typically laying their eggs during or shortly after large rainfall events in late winter and early spring. Female California red-legged frogs deposit egg masses on emergent vegetation so that the masses float on the surface of the water (Hayes and Miyamoto 1984). Egg masses contain about 2,000 to 5,000 moderately-sized (0.08 to 0.11 inch) in diameter, dark reddish brown eggs (Storer 1925, Jennings and Hayes 1985). Eggs hatch in 6 to 14 days (Storer 1925). Tadpoles undergo metamorphosis between 3.5 to 7 months after hatching (Storer 1925, Wright and Wright 1949). Sexual maturity can be attained at 2 years of age by males and 3 years of age by females and is usually reached at 3 to 4 years of age (Jennings and Hayes 1985); adults may live 8 to 10 years (Jennings et al. 1992) although the average life span is considered to be much lower. Juveniles have been observed to be active diurnally and nocturnally, whereas adults are mainly nocturnal. After breeding, California red-legged frogs often disperse from their breeding habitat to forage and seek suitable dry-season habitat. Cover within dry-season aquatic habitat could include boulders; downed trees; logs; agricultural features, such as drains, watering troughs, spring boxes, abandoned sheds, or hay-ricks; and industrial debris. California red-legged frogs use small mammal burrows and moist leaf litter (Rathbun et al. 1993, Jennings and Hayes 1994); incised stream channels with portions narrower and deeper than 18 inches may also provide habitat (61 FR 25813). However, this type of dispersal and habitat use is not observed in all California red-legged frogs and is most likely dependent on the year to year variations in climate and habitat suitability and varying requisites per life stage. For the California red-legged frog, dry-season habitat potentially includes all aquatic and riparian areas within the range of the subspecies and any landscape features that provide cover and moisture (61 FR 25813).

California red-legged frogs spend most of their lives in and near sheltered backwaters of ponds, marshes, springs, streams, and reservoirs. Deep pools with dense stands of overhanging willows and an intermixed fringe of cattails are considered optimal habitat. California red-legged frogs breed in aquatic habitats. Eggs, tadpoles, transformed juveniles, and adults also have been found in ephemeral creeks and drainages and in ponds that do not have riparian vegetation. California red-legged frogs frequently breed in artificial impoundments such as stock ponds, if conditions are appropriate. Although California red-legged frogs successfully breed in streams and riparian systems, high seasonal flows and cold temperatures in streams often make these sites risky environments for eggs and tadpoles. The importance of riparian vegetation for this species is not well understood. When riparian vegetation is present, California red-legged frogs spend considerable time resting and feeding in it; the moisture and camouflage provided by the riparian plant community likely provide good foraging habitat and may facilitate dispersal in addition to providing pools and backwater aquatic areas for breeding. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting population numbers and distribution.

Juvenile and adult California red-legged frogs may disperse long distances from breeding sites throughout the year. They can be encountered living within streams at distances exceeding 1.8 miles from the nearest breeding site, and have been found up to 400 feet from water in adjacent dense riparian vegetation (Bulger et al. 2003). Some California red-legged frogs have moved long distances over land between water sources during winter rains. Adult California red-legged frogs have been documented to move more than 2 miles in northern Santa Cruz County "without apparent regard to topography, vegetation type, or riparian corridors" (Bulger et al. 2003). Most of these overland movements occur at night. These individual frogs were observed to make long-distance movements that are straight-line, point to point migrations over variable upland terrain rather than using riparian corridors for movement between habitats. For the California red-legged frog, suitable habitat is considered to include all aquatic and riparian areas within the range of the species and includes any landscape features that provide cover and moisture (61 FR 25813).

California red-legged frogs have been found at elevations that range from sea level to about 5,000 feet. In the Sierra Nevada Mountains, California red-legged frogs typically occur below 4,000 feet in elevation (61 FR 25813).

The historical range of the California red-legged frog extended coastally from southern Mendocino County and inland from the vicinity of Redding, California, southward to northwestern Baja California, Mexico (Jennings and Hayes 1985, Storer 1925). The California red-legged frog has been extirpated or nearly extirpated from 70 percent of its former range. Historically, this subspecies was found throughout the Central Valley and Sierra Nevada foothills. At present, California red-legged frogs are known to occur in approximately 250 streams or drainages in 22 counties, primarily in central coastal California. Four additional occurrences have been recorded in the Sierra Nevada foothills since listing, bringing the total to five extant populations, compared to approximately 26 historical records (61 FR 25813). Currently, California red-legged frogs are known from three disjunct regions in 26 California counties and one region in Baja California, Mexico (Grismer 2002, Fidenci 2004, Smith and Krofta 2005). 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.

Over-harvesting, habitat loss, non-native species introduction, and urban encroachment are the primary factors that have negatively affected the California red-legged frog throughout its range (Jennings and Hayes 1985, Hayes and Jennings 1988). Habitat loss and degradation, combined with over-exploitation and introduction of exotic predators, were important factors in the decline of the California red-legged frog in the early to mid-1900s. Continuing threats to the California red-legged frog include direct habitat loss due to stream alteration and loss of aquatic habitat, indirect effects of expanding urbanization, competition or predation from non-native species including the bullfrog (*Rana catesbeiana*), catfish (*Ictalurus* spp.), bass (*Micropterus* spp.), mosquitofish (*Gambusia affinis*), red swamp crayfish (*Procambarus clarkii*), and signal crayfish. Chytrid fungus (*Batrachochytrium dendrobatidis*) is a waterborne fungus that can decimate amphibian populations, and is considered a threat to California red-legged frog populations.

Although the presence of California red-legged frogs is correlated with still water deeper than approximately 1.6 feet, riparian shrubbery, and emergent vegetation (Jennings and Hayes 1985), there are numerous locations in the species' historical range where these elements are well represented yet California red-legged frogs appear to be absent. The cause of local extirpations does not appear to be restricted solely to loss of aquatic habitat. The most likely causes of local extirpation are thought to be changes in faunal composition of aquatic ecosystems (i.e., the introduction of non-native predators and competitors) and landscape-scale disturbances that disrupt California red-legged frog population processes, such as dispersal and colonization. The introduction of contaminants or changes in water temperature may also play a role in local extirpations. These changes may also promote the spread of predators, competitors, parasites, and diseases.

Least Bell's Vireo

The least Bell's vireo was federally listed as endangered on May 2, 1986 (51 FR 16474). Critical habitat was designated for the least Bell's vireo on February 2, 1994 (59 FR 4845). The project site is not within designated critical habitat for this species and it will not be discussed further. A draft recovery plan was completed in 1998 (Service 1998). Additional information on the least Bell's vireo may be found in Wilbur (1980), Garrett and Dunn (1981), Miner (1989), Pike and Hays (1992), Zembal et al. (1985), and Service (1998).

The least Bell's vireo is a small, olive-grey migratory songbird that nests and forages almost exclusively in riparian woodland habitats. Bell's vireos as a group are highly territorial and almost exclusively insectivorous. Nesting habitat typically consists of well-developed overstories and understories, and low densities of aquatic and herbaceous cover. The understory frequently contains dense subshrub or shrub thickets. These thickets are often dominated by sandbar willow (*Salix hindsiana*), mulefat (*Baccharis salicifolia*), young individuals of other willow species such as arroyo willow (*S. lasiolepis*) or black willow (*S. gooddingii*), and one or more herbaceous species. Important overstory species include mature arroyo willows and black willows; occasional cottonwoods (*Populus* spp.) and western sycamores (*Platanus racemosa*) also occur in some habitats. Additionally, coast live oaks (*Quercus agrifolia*) can be a locally important overstory component, as can mesquite (*Prosopis* spp.).

Least Bell's vireos begin arriving from their wintering range in southern Baja California and establish breeding territories by mid to late March. They occupy home ranges that typically range in size from 0.5 to 7.5 acres. Following pair formation, it takes approximately 5 to 7 days to finish nest construction and egg-laying. Young typically fledge within 20 to 24 days after eggs are laid. The egg-laying and incubation periods are critical to nesting success as disturbance at this point may result in nest abandonment. Once young are fledged, they wander widely throughout the parents' territory. Most breeding least Bell's vireos depart their breeding grounds by the third week of September and few individuals winter in California.

Historically described as common to abundant in riparian habitats from as far north as Tehama County, California to northern Baja California, Mexico, the least Bell's vireo currently occupies

a small fraction of its former range, restricted now to eight counties in southern California and portions of northern Baja, Mexico. Widespread habitat losses have fragmented most remaining populations into small, disjunct, widely dispersed subpopulations. The decline of this species is attributed, in part, to the combined, perhaps synergistic effects of the widespread loss of riparian habitats and brood-parasitism by the brown-headed cowbird (*Molothrus ater*).

Southwestern Willow Flycatcher

The southwestern willow flycatcher was federally listed as endangered on February 27, 1995 (60 FR 10694) and critical habitat was designated for the subspecies on October 19, 2005 (70 FR 60886). The proposed project site is not within designated critical habitat. A recovery plan for the subspecies was completed in August 2002 (Service 2002a).

The southwestern willow flycatcher's current breeding range extends from southern California to western Texas, including portions of southernmost Nevada and Utah, southwestern Colorado, and northernmost Sonora and Baja California del Norte. Its current range is similar to the historical range, but the quantity of suitable habitat within that range has been much reduced from historical levels. The historical range of the southwestern willow flycatcher in California included all lowland riparian areas in the southern third of the state (Service 2002a). The flycatcher migrates to Mexico, Central, and possibly northern South America during the non-breeding season.

The southwestern willow flycatcher occurs in riparian woodlands along streams and rivers with mature, dense stands of willows (*Salix* spp.), cottonwoods, or smaller spring-fed areas with willows or alders (*Alnus* spp.). They forage within, and occasionally above, the canopy of riparian vegetation, taking insects on the wing or gleaning them from vegetation. Nesting habitat consists of even-aged, structurally homogeneous, and dense riparian vegetation (Brown 1988, Sedgwick and Knopf 1992). Historically, they nested primarily in willows and mulefat with a scattered overstory of cottonwood (Grinnell and Miller 1944). Following recent changes in riparian plant communities, nesting occurs in willows where available, but can also include thickets dominated by tamarisk (*Tamarix* spp.) and Russian olive (*Elaeagnus angustifolia*) (Brown 1988). Fragmented riparian zones with large distances between willow patches and individual willow plants are usually not selected for either nesting or singing (Sedgwick and Knopf 1992).

Southwestern willow flycatchers are typically present and singing on breeding territories by mid-May, although presence and status are often confused by migrating individuals of the northern subspecies (little willow flycatcher; *Empidonax traillii brewsteri*) passing through breeding habitat. The southwestern willow flycatcher builds nests and lays its eggs in late May to early June. They typically raise one brood per year, and clutch size is 3 to 4 eggs (Service 2002a). Fledglings depart the nest at the age of 12 to 15 days in early July and usually disperse from the natal territory at the age of 26 to 30 days. Some variation in these dates has been observed and may be related to altitude, latitude, and renesting. Territories range in size from 0.25 to 5.7 acres, although most are 0.5 to 1.2 acres (Service 2002a). Adults depart from breeding territories

in mid-August to early September. Sixty-six to 78 percent of breeding southwestern willow flycatchers known to have survived returned to the same breeding sites (Service 2002a).

The decline of the southwestern willow flycatcher is attributed to numerous factors, including nest depredation and brood parasitism by the brown-headed cowbird. However, large scale loss of southwestern wetlands, particularly cottonwood-willow riparian habitat, is the principal reason for the southwestern willow flycatcher's current status. Habitat loss is a result of urban and agricultural development, water diversion and impoundment, livestock grazing, and hydrological changes attributable to these and other land uses (60 FR 10694).

ENVIRONMENTAL BASELINE

The implementing regulations for section 7(a)(2) of the Act define the action area as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For the purposes of this biological opinion, we consider the action area to include all areas where people and equipment would be working or staging that may affect the environment, including habitat that could be used by the California red-legged frog, least Bell's vireo, or southwestern willow flycatcher. Based upon the information provided to us, we identify the action area as all portions of the project upon which ground disturbance would occur, either temporarily or permanently, including trenching, backfill, access and maintenance roads, aprons, access ramps, staging areas, the flapgate to the existing channel, and the main channel that is to be placed into a box culvert system. The biological assessment (FEMA 2009) and habitat measurements therein include a 100-foot buffer in habitat measurements. That buffer is included in the action area.

The action area is characterized by disturbed land and some native plant communities. Disturbed areas include development, agricultural lands, ornamental plantings, and existing roads that are either barren or dominated by non-native plant species, such as Himalayan blackberry (*Rubus discolor*), curly dock (*Rumex crispus*), and spiny cocklebur (*Xanthium spinosum*). Upland areas that are not disturbed support non-native grasslands, oak woodland, coastal sage scrub, and chaparral. Plant species indicative of these upland habitats include Harding grass (*Phalaris aquatica*), fennel (*Foeniculum vulgare*), coast live oak, California bay (*Umbellularia californica*), black sage (*Salvia mellifera*), California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis*), bush monkeyflower (*Mimulus aurantiacus*).

The main stem of Fresno Creek and the portion of the Ventura River included in the action area support river channel, riparian scrub and some oak woodland habitats. Typical plant species associated with these habitats on the project site include giant reed (*Arundo donax*), mulefat, sycamore, arroyo willow, mugwort (*Artemisia douglasiana*), tree tobacco (*Nicotiana glauca*), and coast live oak.

California red-legged frog

The California red-legged frog is known to occur in the Ventura River, although it has not been recorded specifically from the project site, primarily because no focused surveys have been performed. The biological assessment submitted with the request to initiate consultation (FEMA 2009) correctly assumes that the species could occur in the project area, and that good habitat is present at the confluence of the Fresno Creek and the river. Lacking specific survey data, we have no information on the numbers of California red-legged frogs that could be present in the action area. We anticipate that the numbers will be relatively low compared to other sites in the California red-legged frog's range due to the intermittent nature of the Ventura River and the scarcity of permanent or semi-permanent water features.

Least Bell's vireo

The Ventura River supports suitable nesting and foraging habitat for the least Bell's vireo. According to the BA (FEMA 2009), "High-quality habitat for this species is found at the outlet location of the proposed project and within the riparian zone of the river." Least Bell's vireos have been recorded in several parts of the Ventura River. For example, one breeding pair and two territorial males were observed in the Ventura River Basin both in 1993 and 1994 (Service 1998). In 1995, one breeding and one territorial male were observed in the same area. Other occurrences of least Bell's vireos in Ventura County include several to the south along the Santa Clara River and associated drainages, and in Santa Barbara County, most from the San Ynez River Basin. Neither the project area nor any area in the Ventura River Basin is within a designated recovery unit (Service 1998). The nearest recovery units are north (Santa Ynez River Metapopulation Unit) and south (Santa Clara River Metapopulation Unit) of the Ventura River Basin.

Despite a lack of specific survey data for the project site, given the habitat and location, it is likely that least Bell's vireos occur within the project area during the breeding season based on the available information. The number of birds the action area could support is estimated based upon the known range of territory size and the areal extent of suitable habitat in the action area. The biological assessment (FEMA 2009) states that riparian and river channel habitat in the action area totals 1.7 acres (with the 100-foot buffer). The average territory of a least Bell's vireo ranges from 0.5 to 7.5 acres (Service 1998). Assuming the minimum territory size applies (0.5 acre), the action area could support 3 to 4 least Bell's vireo territories or pairs (6 to 8 birds). We choose the upper limit because least Bell's vireos are known from areas near the project site, they have been experiencing a recent range expansion due to recovery efforts, and the habitat is considered suitable.

Southwestern willow flycatcher

According to the biological assessment, no documented occurrences of the southwestern willow flycatcher have been recorded within a 10-mile radius of the project area (FEMA 2009).

Although the biological assessment further states that no documented occurrences have been reported in Ventura County, our data indicate that the species occurs along the Santa Clara River and has been reported nesting from the Vern Freeman Diversion up to the Fillmore Fish Hatchery. We also have one unconfirmed potential nesting pair on the Ventura River downstream from Foster Park. We believe that the potential exists for the southwestern willow flycatcher to nest anywhere suitable habitat exists along the Ventura River.

The recovery plan for the southwestern willow flycatcher (Service 2002a) indicates that the project area is in the historical breeding range of the species but not within a recovery unit. The southwestern willow flycatcher has the potential to occur in the project area because the project area is in the southwestern willow flycatcher's historical range and provides suitable nesting and foraging habitat in the riparian zone of the Ventura River. Arrivals are typically in mid-May, and departures occur in late August.

Lacking specific information on the number of southwestern willow flycatchers present in the action area, we assume that any suitable habitat in the action area could be occupied, and that the number of pairs present during breeding season may be calculated from average territory size. Average territory size for the southwestern willow flycatcher ranges from 0.25 to 5.7 acres (Service 2002a). Assuming that potential southwestern willow flycatcher habitat in the action area includes riparian and river areas, the biological assessment places the total (with a 100-foot buffer) at 1.7 acres. Therefore, we estimate that the action area could support approximately 1 to 7 pairs of southwestern willow flycatcher. Given the scarcity of known occurrences along the Ventura River, the general status of the species, and the quality of habitat at the project site, we believe the potential number of pairs would be less than 7. Therefore, without better information, we estimate that action area could support up to 3 pairs of southwestern willow flycatchers during the breeding season.

## EFFECTS OF THE ACTION

### California red-legged frog

Direct impacts to adult and sub-adult California red-legged frogs in the action area could include injury or mortality from being crushed by grading equipment, construction debris, and worker foot traffic. These impacts will be reduced by minimizing and clearly demarcating the boundaries of the project areas and equipment access routes and locating staging areas outside of riparian areas or other water bodies. These effects will also be minimized by conducting awareness training sessions for workers, which will inform them of the presence and protected status of this species and the measures that are being implemented to protect it during project activities.

(Note: Although ongoing maintenance is included in the Project Description, it is not included in this analysis. FEMA's discretionary authority is limited in time and not likely to extend beyond the initial construction, therefore we cannot include those activities in our Effects Analysis.)

Direct impacts to California red-legged frogs would also be reduced by relocating California red-legged frogs, when found, prior to the start of construction activities. California red-legged frogs could be injured or killed if they are improperly handled or contained during capture and relocation efforts. California red-legged frogs that are relocated are at increased risk of predation, increased competition, and other factors associated with relocation to an unfamiliar environment. These effects will be reduced or prevented with the use of Service-approved biologists to capture and move California red-legged frogs to appropriate habitats; however, the District did not propose any measures on how biologists would be approved.

Trash left during or after project activities could attract predators to work sites, which could, in turn, prey on California red-legged frogs. For example, raccoons (*Procyon lotor*) are attracted to trash and also prey opportunistically on California red-legged frogs. This potential impact will be reduced or avoided by careful control of trash at all work sites.

Construction activities could cause increased siltation of both Fresno Creek and the Ventura River, thereby degrading California red-legged frog habitat downstream of the project site. The potential for this impact to occur will be reduced by implementing BMPs. Accidental spills of hazardous materials or careless fueling or oiling of vehicles or equipment could degrade aquatic or upland habitat to a degree where California red-legged frogs are adversely affected or killed; however, the District has proposed to implement measures to prevent such spills from reaching waterways, such as having staging and re-fueling areas away from the stream.

Some potential also exists for disturbance of habitat to cause the spread or establishment of non-native invasive plant species. Non-native species can out-compete native plant species and displace them, reducing habitat values for the California red-legged frog. The District proposal to clean equipment to prevent the spread of weed seeds may reduce this effect; however, it is likely that seeds already within the soil will be stimulated into germination by ground disturbance and removal of native plants.

Chytrid fungus (*Batrachochytrium dendrobatidis* ) is a water-borne fungus that is spread through direct contact between aquatic animals and by spores that are able to move short distances through water. The fungus attacks the thickened parts of a frog's skin that have keratin, such as the mouthparts of tadpoles and the toes of adults. This fungus can decimate amphibian populations by causing fungal dermatitis. Infection typically results in death within 1 to 2 weeks, but not before infected animals can spread the fungal spores to other aquatic species, ponds, and streams. Once a pond or waterway has become infected with chytrid fungus, it is unknown how long the fungus will persist. Chytrid fungus could be spread if infected California red-legged frogs are relocated and introduced into areas with healthy California red-legged frogs. It is also possible that infected equipment or clothing could introduce chytrid fungus into areas where it did not previously occur. If this occurs in the action area, many California red-legged

frogs could be affected. The District proposes to use the Declining Amphibian Population Task Force Code of Fieldwork Practice to reduce the chances that chytrid fungus would not be spread by project activities.

The District also proposes to take injured California red-legged frogs for professional treatment to survive. The monitoring biologist would transport the frog to the location where a qualified professional could provide the needed treatment. The location of a qualified professional to assist the frog will have been documented prior to the start of construction. Any successfully treated frog would be released at an appropriate location as soon as its recovery allows. We recommend that this measure not be pursued. Unfortunately, veterinarian treatment for amphibians is usually not successful, especially if the injuries are severe enough to warrant taking the animals from the wild. Also, removing a California red-legged frog from the wild and holding it in a facility and releasing back into the wild poses a regulatory problem that cannot be handled in a biological opinion. Lastly, the risk of disease transfer would be increased. We recommend that any injured California red-legged frogs be simply relocated as carefully as possible.

Least Bell's Vireo and Southwestern Willow Flycatcher

Both temporary and permanent loss of riparian and scrub habitat is expected as a result of the proposed project activities. The loss of habitat within a territory could diminish available foraging and sheltering habitat for the least Bell's vireo and southwestern willow flycatcher. Temporary or permanent loss of habitat may cause the species to seek out new territories and breeding sites. Moving to unfamiliar territory may expose individuals to exhaustion and starvation associated with decreased foraging opportunities, increased predation risk, inter- and intraspecific interactions, and decreased probability of nesting success. The District proposes to restore suitable habitat for these species at the Ventura River outflow, which will minimize the impacts to the least Bell's vireos and southwestern willow flycatcher.

If construction occurs when active nests are present in the action area, worker foot traffic and construction equipment could dislodge the nests and crush eggs. Fledglings in the action area could be flushed from protected areas by worker or construction vehicle movement, excessive noise, or physical impact. This threat would be minimized by the District’s proposal to conduct project activities outside of the breeding season and by having a qualified biologist conduct pre-construction surveys.

The least Bell’s vireo and southwestern willow flycatcher are sensitive to prolonged, loud noise. In addition, excessive airborne or deposited dust may degrade habitat to the point that it is no longer suitable for either species. Project activities causing noise and dust include hammering piles, creating rock groins, grading access routes, and moving vehicles on dirt roads. These activities would take place within suitable habitat for both species and may temporarily or permanently cause individuals to abandon eggs or juveniles, or vacate a territory. This could cause failure of a nesting attempt; death of eggs and fledglings; and expose adults to increased predation risk, greater inter- and intraspecific interactions, and decreased foraging opportunities.

This threat would be minimized by conducting project activities after the breeding season, having a qualified biologist conduct pre-construction surveys, and completing these activities in the shortest time possible, as proposed by the District.

Trash left during or after project activities could attract predators to work sites, which could prey on least Bell's vireos or southwestern willow flycatcher. For example, coyotes (*Canis latrans*) and raccoons are attracted to trash and could also prey opportunistically on either species. This potential impact will be reduced or avoided by the District's proposal to contain and control trash at all work sites.

Restoration efforts may provide an overall benefit to least Bell's vireos and southwestern willow flycatcher; however, noise, ground disturbance, and human presence may temporarily cause adverse effects to these species. This threat would be minimized or eliminated by the District's proposal to conduct restoration activities outside the breeding season.

## 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. We are unaware of any non-federal actions that are reasonably certain to occur in the action area.

## CONCLUSION

After reviewing the current status of the California red-legged frog, least Bell's vireo, and southwestern willow flycatcher, the environmental baseline for the action, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the Fresno Canyon Flood Mitigation Project, as proposed, is not likely to jeopardize the continued existence of the California red-legged frog, least Bell's vireo, and southwestern willow flycatcher. We have reached this conclusion for the following reasons:

1. The number of California red-legged frogs, least Bell's vireos, or southwestern willow flycatchers likely to be affected by projects activities will be very low.

2. The low number of individuals likely to be affected by the project will not appreciably reduce the likelihood of any of the species' survival and recovery because many more individuals and larger habitat areas outside of the action area will remain.

3. The District has proposed numerous and comprehensive measures to avoid and minimize potential effects.

4. The District proposes to restore habitat that could support all three species.

5. The project is being implemented in a manner that will minimize damage to areas that could support the California red-legged frog, least Bell's vireo, and southwestern willow flycatcher.

Critical habitat for these species has been designated in other parts of their ranges; however, this action does not affect any of those areas and no destruction or adverse modification of that critical habitat would occur as a result of the proposed project.

## INCIDENTAL TAKE STATEMENT

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

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

### California red-legged frog

The Service anticipates that incidental take of California red-legged frogs will be difficult to detect for the following reason(s): the species has a small body size; finding a dead or injured specimen is unlikely; losses may be masked by seasonal fluctuations in numbers or other causes; and the California red-legged frog occurs in habitat (water, dense vegetation) that makes detection difficult. The District proposes numerous measures to avoid and minimize the effects to the California red-legged frog; however, some take is likely to occur as a result of equipment movement, grading, and foot traffic. Also, all California red-legged frogs captured and relocated

are considered to be taken, although an exact number of captured individuals is impossible to estimate.

The District has proposed that if more than two California red-legged frogs are found dead or injured as a result of project activities within a 12-month period, the District will contact the Service immediately so we can review the project activities to determine whether additional protective measures are needed. We agree that this is a reasonable amount of take that can be anticipated, in addition to any California red-legged frogs taken by capture for relocation purposes.

Least Bell's vireo

We anticipate that few, if any, least Bell's vireos will be taken by the project activities. The entire area of suitable habitat that could support least Bell's vireos is relatively small (1.7 acres) and could support, at most, 3 to 4 pairs (6 to 8 birds). This many birds are unlikely to be at the project site due to the lack historical records of their occurrence in the area and the quality and extent of the habitat. Also, the District proposes to work only during the non-breeding season, which will avoid direct effects. We believe it is unlikely that any least Bell's vireos will be killed or injured by the action; however, the temporary loss of suitable nesting habitat may interfere with potential breeding, roosting and foraging behaviors of birds that return to the project area during the breeding season. By our estimate, up to 3 pairs (6 individuals) of least Bell's vireos could be taken as a result of temporary habitat loss.

Southwestern willow flycatcher

We anticipate that few, if any, southwestern willow flycatchers will be taken by the project activities. The entire area of suitable habitat that could support southwestern willow flycatchers is relatively small (1.7 acres) and could support, at most, 3 pairs or 6 birds. This many birds are unlikely to be at the project site due to the lack historical records of their occurrence in the area and the quality and extent of the habitat. Also, the District proposes to work only during the non-breeding season, which will avoid direct effects that could result in injury or mortality. We believe it is unlikely that any southwestern willow flycatchers will be killed or injured by the action; however, the temporary loss of suitable nesting habitat may interfere with potential breeding, roosting and foraging behaviors of birds that return to the project area during the breeding season. Therefore, we anticipate that the amount of take that may occur will be no more than 1 pair, or 2 birds due to habitat loss.

The exemption from the section 9 prohibitions on take described above do not extend to ongoing maintenance or repair. The take exemption is granted to FEMA while it retains discretionary authority over the project and while all other requirements of this biological opinion are being met by the District. Once FEMA’s discretionary authority lapses, the take exemption expires and any take that could result from maintenance after that time would not be exempted. Only if FEMA agrees to retain its discretionary authority for the life of the flood mitigation facilities would we be able to extend the take exemption.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize the impacts of the incidental take of the California red-legged frog.

> The District must seek Service approval of any biologists engaged in capture, handling, and relocation of California red-legged frogs. Although the project description includes using "Service-approved biologists" for a number of tasks, no mechanism for such approval is provided.

We believe that the avoidance and minimization measures proposed by the District are comprehensive and no other measures are required to address the potential for California red-legged frogs to be killed or injured by equipment or foot traffic, as long as all of the proposed measures are implemented. Also, we do not believe any reasonable and prudent measures are warranted for the least Bell's vireo and southwestern willow flycatcher given the source of incidental take we anticipate (temporary habitat loss) and because of the comprehensiveness of the proposed measures. The implementation by the District of the proposed avoidance and minimization measures is required and must be a binding part of any funding authorization provided by FEMA.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the District must comply with the following terms and conditions, which implement the reasonable and prudent measure described above and outline reporting and monitoring requirements. These terms and conditions are non-discretionary.

The following terms and conditions implement reasonable and prudent measure number 1:

1. At least 30 days prior to the onset of activities, the District must submit the names and credentials of biologists who would conduct activities specified in the avoidance and minimization measures proposed by the District. No project activities can begin until the District has received written approval from the Service that the biologists are qualified to conduct the work.

2. Biologists to be approved for monitoring or surveys must have demonstrable experience in identification of California red-legged frogs. If the biologist is proposed to conduct capture and relocation, that individual must also have experience with handling, transporting, and releasing California red-legged frogs. Biologists who have been approved in the past for such activities are most likely to be approved.

REPORTING REQUIREMENTS

The District provided several monitoring and reporting measures in its project description. The following reiterates those measures and expands upon them.

The District must provide a written annual report to the Service by January 27 of each year that this biological opinion is in effect. The report will document the number of California red-legged frogs, least Bell's vireos, or southwestern willow flycatchers killed or injured by project activities, if any. The report will also provide a summary of the previous year's activities and their effects on the California red-legged frog, least Bell's vireo, and southwestern willow flycatcher.

The report shall contain information on the following: (1) the type of activities that occurred in the action area (e.g., construction activities, monitoring); (2) the location of these activities; (3) a description of the habitat in which these activities occurred; (4) the number of California red-legged frogs captured and relocated; (5) the locations from which California red-legged frogs were moved and to which they were relocated; (8) the status of removal activities for exotic vegetation and habitat restoration; (9) the results of any surveys conducted for any listed species; (10) an analysis of the effectiveness of the avoidance and minimization measures and recommendations for future measures; and (11) any other pertinent information. The first report will be due the first January after the initiation of ground-disturbing activities. This reporting is not in lieu of reporting required immediately upon the take of California red-legged frog, least Bell's vireo, or southwestern willow flycatcher as described below.

DISPOSITION OF DEAD OR INJURED SPECIMENS

Within three days of locating any dead or injured California red-legged frogs, least Bell's vireos, or southwestern willow flycatchers, FEMA or the District must notify the Ventura Fish and Wildlife Office by telephone (805) 644-1766 and in writing (2493 Portola Road, Suite B, Ventura, California 93003). The report shall include the time and date, location of the carcass, cause of death, if known, likely source of injury, and any other pertinent information.

Care must be taken in handling dead specimens to preserve biological material in the best possible state for later analysis. Should any injured listed species survive, the Service must be contacted regarding their final disposition. The remains of listed species must be placed with educational or research institutions holding the appropriate State and Federal permits. For California red-legged frog, the appropriate institution is the Santa Barbara Natural History Museum (Contact: Paul Collins, Santa Barbara Natural History Museum, Vertebrate Zoology Department, 2559 Puesta Del Sol, Santa Barbara, California 93460, (telephone: (805) 682-4711, extension 321). Any specimens of least Bell's vireos or southwestern willow flycatcher must be placed with the Western Foundation of Vertebrate Zoology, 439 Calle San Pablo, Camarillo, California 93012 (telephone: (805) 388-9944). Other depositories may be authorized by the Service on a case-by-case basis.

Should any injured individuals of these species survive, the Service must be contacted regarding their final disposition.

## CONSERVATION RECOMMENDATIONS

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

> We recommend that the District have a biologist monitor the project site for a few years following completion of the action and restoration to determine if California red-legged frogs, least Bell's vireos, or southwestern willow flycatchers are using the area. This information would be valuable for planning future projects.

The Service requests notification of the implementation of this conservation recommendation so we may be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats.

## REINITIATION NOTICE

This concludes formal consultation on the action outlined in the Project Description section of this biological opinion. 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 retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat 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, please contact Rick Farris of our staff at (805) 644-1766, extension 316, or by electronic mail at rick_farris@fws.gov.

Sincerely,

/s/: Diane K. Noda

Diane K. Noda
Field Supervisor

# LITERATURE CITED


Brown, B.T. 1988. Breeding ecology of a willow flycatcher population in Grand Canyon, Arizona. Western Birds 19: 25-33.

Bulger, J.B., N.J. Scott, and R.B. Seymour. 2003. Terrestrial activity and conservation of adult California red-legged frogs *Rana aurora draytonii* in coastal forests and grasslands. Biological conservation 110 (2003):85-95.

Cachuma Operation and Maintenance Board. 2004. Final program and project specific environmental impact report/statement for the lower Santa Ynez River fish management plan and Cachuma project biological opinion for southern steelhead trout. Prepared by U.S. Department of the Interior, Bureau of Reclamation, Mid-Pacific Region, South-Central California Area Office, Fresno, California and COMB, Santa Barbara, California.

Cachuma Conservation Release Board. 2008. Biological Assessment. Fish Passage Improvements at Cross Creek Ranch – El Jaro Creek. Santa Barbara, California.

California Natural Diversity Data Base. 2003. Wildlife and Habitat Data Analysis Branch, California Department of Fish and Game. Sacramento, California.

California Natural Diversity Data Base. 2007. Rarefind: A database application for the California Department of Fish and Game, Natural Heritage Division data, California Natural Diversity Data Base, Sacramento.

California Department of Fish and Game. 2008. Rarefind: A database application for the California Department of Fish and Game, Natural Heritage Division data, California Natural Diversity Data Base, Sacramento.

California Natural Diversity Data Base. 2009. Wildlife and Habitat Data Analysis Branch, California Department of Fish and Game. Sacramento, California.

County of Santa Barbara. 2006. Creek Maintenance. Available on the internet at http://www.countyofsb.org/pwd/water/creek.htm. Visited on August 14, 2007

County of Santa Barbara. 2007. 2007-2008 Water Resources Annual Maintenance Plan. Available on the internet at http://www.countyofsb.org/pwd/water/annual_plan.htm. Visited on August 14, 2007.

Federal Emergency Management Agency (FEMA). 2009. Biological Assessment for USFWS: Fresno Canyon Flood Mitigation; Ventura County Watershed Protection District (PDMC-PJ-09-CA-2007-013). Dept. of Homeland Security, Oakland, CA.

Fidenci, P. 2004. The California red-legged frog, *Rana aurora draytonii*, along the Arroyo Santo Domingo, Northern Baja California, Mexico. The Herpetological Journal, Volume 88. London, England.

Garrett, K. and J. Dunn. 1981. Birds of Southern California: Status and Distribution. Los Angeles Audubon Society, California.

Grinnell, J. and A. Miller. 1944. The distribution of the birds of California. Pacific Coast Avifauna No. 27. Contribution from the Museum of Zoology of the University of California, Berkeley. Reprinted by Artemisia Press, Lee Vining, California, 1986. 617 pp.

Grismer, L. 2002. Reptiles and Amphibians of Baja California, Including its Pacific Island and the Islands in the Sea of Cortez. University of California Press, Berkley and Los Angeles, California.

Hayes, M.P. and M.M. Miyamoto. 1984. Biochemical, behavioral and body size differences between *Rana aurora aurora* and *R. a. draytonii*. Copeia 1984(4):1018-1022.

Hayes, M.P., and M.R. Tennant. 1985. Diet and feeding behavior of the California red-legged frog, *Rana aurora draytonii* (Ranidae). The Southwestern Naturalist 30(4):601-605.

Hayes, M.P. and M.R. Jennings. 1988. Habitat correlates of distribution of the California red-legged frog (*Rana aurora draytonii*) and the foothill yellow-legged frog (*Rana boylii*): Implication for management. Pp. 144-158. In proceedings of the symposium on the management of amphibians, reptiles, and small mammals in North America. R. Sarzo, K.E. Severson, and D.R. Patton (technical coordinators). U.S.D.A. Forest Service General Technical Report RM-166.

Jennings, M.R. and M.P. Hayes. 1985. Pre-1900 over harvest of California red-legged frogs (*Rana aurora draytonii*): The inducement for bullfrog (*Rana catesbeiana*) introduction. Herpetologica 31(1):94-103.

Jennings, M. 1988. Natural history and decline of native ranids in California. Pp. 1-143 *in* Proceedings of the conference on California herpetology. H.F. DeLise, P.R. Brown, B. Kaufman, and B.M. McGurty (editors), Southwestern Herpetologists Society Special Publication, 1-143.

Jennings, M.R. and M.P. Hayes. 1990. Status of the California red-legged frog *Rana aurora draytonii* in the Pescadero Marsh Natural Preserve. Report prepared for the California Department of Parks and Recreation, Sacramento, California. 30 pages + Tables and Figures.

Jennings, M.R., M.P. Hayes, and D.C. Holland. 1992. A petition to the U.S. Fish and Wildlife Service to place the California red-legged frog (*Rana aurora draytonii*) and the western pond turtle (*Clemmys marmorata*) on the list of endangered and threatened wildlife and plants. 21 pp.

Jennings, M.R., and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final report to California Dept. of Fish and Game. Pp. 12-16.

Lehman, P.F. 1994. The Birds of Santa Barbara County, California. Vertebrate Museum. University of California, Santa Barbara.

Licht, L.E. 1974. Survival of embryos, tadpoles, and adults of the frogs *Rana aurora aurora* and *Rana pretiosa pretiosa* sympatric in southwestern British Columbia. Can. J. Zool. 52:613-627. Mifflin Company, Boston, MA. 514 pp.

Miner, K.L. 1989. Foraging ecology of the least Bell's Vireo, *Vireo bellii pusillus.* Unpublished Masters Thesis, San Diego State University, San Diego, California.

Moyle, P.B., 2002. Inland fishes of California, revised and expanded. Second ed. University of California Press, Berkeley, California. 502 pp.

Nussbaum, R. A., Brodie, E. D. Jr., and Storm, R. M. 1983. Amphibians and Reptiles of the Pacific Northwest. Univ. Idaho Press, Moscow, Idaho.

Pike, J. and L. Hays. 1992. The status and management of the least Bell's vireo within the Prado Basin, California, 1986-1991. Unpublished report, California State University, Long Beach Foundation and U.S. Fish and Wildlife Service, Laguna Niguel, California.

Rathbun, G.B., M.R. Jennings, T.G. Murphey, and N.R. Siepel. 1993. Status and ecology of sensitive aquatic vertebrates in lower San Simeon and Pico Creeks, San Luis Obispo County, California. U.S. Fish and Wildlife Service, National Ecology Research Center, San Simeon, California. Prepared for the California Department of Parks and Recreation. 103 pp.

Rathbun, G.B., and J. Schneider. 2001. Translocation of California red-legged frogs (*Rana aurora draytonii*). Wildlife Society Bulletin 29:1300-1303.

Reis, D.K. 1999. Habitat characteristics of California red-legged frogs (*Rana aurora draytonii*): Ecological differences between eggs, tadpoles, and adults in a coastal brackish and freshwater system. Master's thesis submitted to San Jose State University, San Jose, California.

Schmieder, R.R. and R.S. Nauman. 1994. Effects of non-native aquatic predators on premetamorphic California red-legged frogs (*Rana aurora draytonii*). University of California, Santa Cruz. 12pp.

Scott, N. 2002. Annual Report, California red-legged frog, *Rana aurora draytonii*, Permit TE-036501-4. Unpublished report submitted to the Ventura Fish and Wildlife Office.

Sedgwick, J.A. and F.L. Knopf. 1992. Describing willow flycatcher habitats: scale perspectives and gender differences. Condor 94:720-733.

Shaffer, H.B., G.M. Fellers, S.R. Voss, J.C. Oliver, and G.B. Pauly. 2004. Species boundaries, phylogeography and conservation genetics of the red-legged frog (*Rana aurora/draytonii*) complex. Molecular Ecology 13:2667–2677.

Smith, R. and D. Krofta. 2005. Field notes documenting the occurrence of California red-legged frogs in Baja California, Mexico. In litt.

Sogge, M.K., R.M. Marshall, S.J. Sferra, and T.J. Tibbitts. 1997a. A Southwestern Willow Flycatcher Natural History Summary and Survey Protocol. USDI National Park Service, Colorado Plateau Research Station at Northern Arizona University. Technical Report NPS/NAUCPRS/NRTR-97/12.

Stebbins, R.C. 1985. A field guide to western reptiles and amphibians. Houghton Mifflin Company, Boston, Massachusetts.

Storer, T.I. 1925. A synopsis of the Amphibia of California. University of California Publications in Zoology 27:1-342.

Twedt, B. 1993. A comparative ecology of *Rana aurora* (Baird and Girard) and *Rana*

U.S. Bureau of Reclamation. 2003. Biological assessment for fish passage enhancement projects on Salsipuedes Creek and Quiota Creek and a demonstration project on El Jaro Creek. Prepared by U.S. Department of the Interior, Bureau of Reclamation, Mid-Pacific Region, South-Central California Area Office. Fresno, California.

U.S. Fish and Wildlife Service. 1998. Draft Recovery Plan for the least Bell's vireo (*Vireo bellii pusillus*). Portland, Oregon.

U.S. Fish and Wildlife Service. 1998. Draft recovery plan for the least Bell's vireo (*Vireo bellii pusillus*). Portland, Oregon. 139 pp.

U.S. Fish and Wildlife Service. 1999. Programmatic formal Endangered Species Act consultation on issuance of permits under section 404 of the Clean Water Act of authorizations under the Nationwide Permit Program for projects that may affect the California red-legged frog. Dated January 26, 1999. Issued to: Art Champ, U.S. Army Corps of Engineers, Sacramento District, Sacramento, California; Calvin Fong, U.S. Army Corps of Engineers, San Francisco District, San Francisco, California; and Richard

Schubel, U.S. Army Corps of Engineers, Los Angeles District, Los Angeles, California. Issued by: Ventura and Sacramento Fish and Wildlife Offices, Ventura and Sacramento, California.

U.S. Fish and Wildlife Service. 2002. Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service , Portland, Oregon. viii + 173 pp.

U.S. Fish and Wildlife Service. 2002a. Final recovery plan for the southwestern willow flycatcher (*Empidonax traillii extimus*). Albuquerque, New Mexico. i-ix + 210 pp., Appendices A-O.

Unocal. 2004a. Guadalupe restoration project: Ecological monitoring report. 1st Quarter 2004. May 2004. Unpublished. Guadalupe, California.

Unocal. 2004b. Guadalupe restoration project: Ecological monitoring report. 2nd Quarter 2004. August 2004. Unpublished. Guadalupe, California.

Unocal . 2004c. Guadalupe restoration project: Ecological monitoring report. 3rd Quarter 2004. November 2004. Unpublished. Guadalupe, California.

Unocal. 2004d. Guadalupe restoration project: Habitat inventory and ecological database. November 2004. Unpublished. Guadalupe, California.

URS Group, Inc. 2008. Final Biological Assessment for USFWS: Slope and Road Repair at Swanton, PM 4.99, County of Santa Cruz. FEMA-1646-DR-CA, PW #2749. Report prepared for U.S. Department of Homeland Security, Federal Emergency Management Agency.

Ventura County Public Works. 2009. Application for Pre-Disaster Mitigation Funding from FEMA through the California Emergency Management Agency.

Whitfield, M.J., K. Enos, and S. Rowe. 1997. Reproductive response of the Southwestern Willow Flycatcher (*Empidonax traillii extimus*) to the removal of Brown-headed Cowbirds. Draft Report prepared for U.S. Army Corps of Engineers, Sacramento District, and Calif. Dept. of Fish and Game, Wildlife Manage. Div., Bird and Mammal Conservation Program.

Wilbur, S. 1980. Status report on the least Bell's vireo. Unpublished report. U.S. Fish and Wildlife Service. Portland, Oregon.

Wright, A.H. and A.A. Wright. 1949. Handbook of frogs and toads of the United States and Canada. Comstock Publishing Company, Inc., Ithaca, NY. xii + 640 pp.

Zembal, R., K. Kramer and R. Bransfield. 1985. Survey of Vegetation and Vertebrate Fauna in the Prado Basin and the Santa Ana River Canyon, California. Unpublished report, U.S. Fish and Wildlife Service, Laguna Niguel, California.

**The Declining Amphibian Populations Task Force Fieldwork Code of Practice**

1. Remove mud, snails, algae, and other debris from nets, traps, boots, vehicle tires, and all other surfaces. Rinse cleaned items with sterilized (e.g., boiled or treated) water before leaving each study site.

2. Scrub boots, nets, traps, and other types of equipment used in the aquatic environment with 70 percent ethanol solution or a bleach solution of one-half to one cup of bleach in one gallon of water and rinse clean with sterilized water between study sites. Avoid cleaning equipment in the immediate vicinity of a pond, wetland, or riparian area.

3. In remote locations, clean all equipment with 70 percent ethanol or a bleach solution, and rinse with sterile water upon return to the lab or a "base camp." Elsewhere, when laundry facilities are available, remove nets from poles and wash (in a protective mesh laundry bag) with bleach on a "delicate" cycle.

4. When working at sites with known or suspected disease problems, or when sampling populations of rare or isolated species, wear disposable gloves and change them between handling each animal. Dedicate separate sets of nets, boots, traps, and other equipment to each site being visited. Clean and store them separately at the end of each field day.

5. Safely dispose of used cleaning materials and fluids. Do not dispose of cleaning materials and fluids in or near ponds, wetland, and riparian areas; if necessary, return them to the lab for proper disposal. Safely dispose of used disposable gloves in sealed bags.

6. When amphibians are collected, ensure the separation of animals from different sites and take great care to avoid indirect contact (e.g., via handling or reuse of containers) between them or with other captive animals. Do not expose animals to unsterilized vegetation or soils which have been taken from other sites. Always use disinfected and disposable husbandry equipment.

7. If a dead amphibian is found, place it in a sealable plastic bag and refrigerate (do not freeze). If any captured live amphibians appear unhealthy, retain each animal in a separate plastic container that allows air circulation and provides a moist environment from a damp sponge or sphagnum moss. For each collection of live or dead animals, record the date and time collected, location of collection, name of collector, condition of animal upon collection, and any other relevant environmental conditions observed at the time of collection. Immediately contact the Ventura Fish and Wildlife Office at (805) 644-1766 for further instructions.

The Fieldwork Code of Practice has been produced by the Declining Amphibian Populations Task Force with valuable assistance from Begona Arano, Andrew Cunningham, Tom Langton, Jamie Reaser, and Stan Sessions. For further information on this Code, or on the Declining Amphibian Populations Task Force, contact John Wilkinson, Biology Department, the Open University, Walton Hall, Milton Keynes, MK7 6AA, UK.

Email: DAPTF@open.ac.uk
Fax: +44 (0)

# Delineation of Jurisdiction:
# Fresno Canyon Storm Drain Improvement Project
# Casitas Springs, Ventura County

**Prepared For:** Impact Sciences, Inc., Camarillo, CA

**Prepared By:** Edith Read, PhD, E Read and Associates, Inc.
Orange, CA (714) 366-8857

**February 19, 2013**

# TABLE OF CONTENTS

# LIST OF ACRONYMS

| | |
|---|---|
| CDFW | California Department of Fish and Wildlife |
| GIS | Geographic Information System |
| NMFS | National Marine Fisheries Service |
| OHWM | Ordinary High Water Mark |
| RWQCB | Regional Water Quality Control Board |
| SWRCB | State Water Resources Control Board (California) |
| USACE | United States Army Corps of Engineers |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| VCWPD | Ventura County Watershed Protection District |

## 1.0 PROJECT LOCATION AND DESCRIPTION

A new flood control channel is proposed for the community of Casitas Springs, Ventura County (Figures 1 and 2). The topographic reference for the site location is an un-numbered section of Township 3 North, Range 23 West, of the Ventura United States Geological Survey (USGS) 7.5' quadrangle.

Much of this community was constructed historically in the floodplain of lower Fresno Canyon at its confluence with the Ventura River. A Draft Biological Assessment for the project (URS, 2009) reported that storm water and debris flows from Fresno Canyon flooded this community three times between 1995 and 2005, resulting in damage to homes and requiring the closure of Ventura Avenue (SR 33) for up to two days during each flood event. The proposed project would be constructed by the Ventura County Watershed Protection District (VCWPD) and consist primarily of an extended box culvert with an open rectangular channel extending from lower Fresno Canyon to the Ventura River. This system would replace, and have a different alignment from, an existing flood control channel that is inadequately sized to carry flood flows from Fresno Canyon. The proposed project would retain this existing channel as a secondary system to receive overflows from an emergency spillway constructed at the entrance to the new channel.

The entire length of the new system would be about 1,400 feet, consisting of an entrance about 300 feet long, a box culvert about 600 feet long, an open rectangular channel about 300 feet long, and an outlet structure about 200 feet long. The entire system would have the capacity to convey fully bulked flows resulting from a 100-year flood event. A one-way flapgate would be constructed where the new channel daylights at the Ventura River. A pathway around the flapgate would be constructed to allow wildlife to bypass the flapgate. Two maintenance roads would be constructed, one on top of the box culvert section and another immediately adjacent to the north site of the open rectangular channel.

This report assesses the extent of Federal and State permitting jurisdiction potentially affected by the project. It is anticipated that this information will be used to support permitting of the project through Federal and State regulatory agencies.

# 2.0 DELINEATION METHODS

## 2.1 Document Review

A review of potential jurisdictional features was conducted for guidance in the field, based on the USGS topographic map of the project area, aerial photographs, and a map of the proposed project location. The small size of the site is below the scale at which soil surveys of the Natural Resources Conservation Service (NRCS) are appropriately applied, and therefore NRCS and hydric soil maps were not referenced in this delineation. With the exception of cleared and weed-dominated areas, classification of vegetation was based on the current manual for California (Sawyer et al., 2009).

Protocol documents consulted for delineation of Federal jurisdiction consisted of Lichvar and McColley (2008) regarding identification of "ordinary high water mark" in arid regions, the U.S. Army Corps of Engineers (USACE) guidelines for interpretation of Federal jurisdiction following the Rapanos, Carabell, and SWANCC decisions (USACE, 2007a,b; USACE and EPA, 2007), the USACE 1987 Wetland Delineation Manual (Environmental Laboratory, 1987), and the arid west regional supplement to the USACE 1987 manual (USACE 2008). The 2012 National Wetlands Plant List for California was consulted for wetland status of species (USACE, 2012).

## 2.2 Field Survey

A field survey of the site was conducted by Edith Read on January 29, 2013. Site features were assessed for potential indicators of stream, riparian, or wetland functions. Indicators of wetland functions typically include wetland or riparian vegetation, and/or soils with anaerobic, redoxymorphic, or hydric features. However, soils were not sampled due to the high proportion of cobbles and rocks, and general impenetrability of the substrate where hydrophytic vegetation was observed. Instead, wetland status was inferred from the species composition and dominance of hydrophytic vegetation, and presence/absence of other indicators such as saturated or cracked surface soil.

Maps were prepared using Geographic Information System (GIS) overlays onto orthorectified aerial imagery obtained from the GIS vendor (ESRI).

## 2.3 Delineation Criteria

Delineation of California State jurisdiction (CDFW and RWQCB) was based on definitions and regulations specified by Sections 1600-1616 of the Fish and Game Code, Title 14 of the California Code of Regulations, and Section 13050 of the California Water Code. A preliminary draft policy on wetland protection issued by the State Water Resources Control Board (SWRCB, 2013) was also consulted in anticipation that the wetland definition and protocols contained in this policy may be adopted by the State within the permitting timeframe of this project.

Wetland status of plant species was based on the National Wetlands Plant List for California (USACE, 2012).

### State

*CDFW*. The California Department of Fish and Wildlife (CDFW) has jurisdictional authority over resources associated with rivers, streams, and lakes.[1] The California Code of Regulations define a stream as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish and other aquatic life including watercourses having a surface or sub surface flow that supports or has supported riparian vegetation."[2] CDFW jurisdiction typically extends between the top of each bank or to the outer edge of contiguous riparian vegetation, whichever is greater. For this project, limits of CDFW jurisdiction were drawn to the outer extent of riparian canopy.

*RWQCB*. Federal authority over water quality under Section 401 of the Federal Clean Water Act is typically delegated to regional water quality control boards unless a project encompasses more than one region, in which case the State Water Resources Control Board may assert regulatory authority. The current Project falls under the authority of the Los Angeles Regional Water Quality Control Board. Section 401 of the Clean Water Act requires that "any applicant for a Federal permit for activities that involve a discharge to Waters of the U.S., shall provide the Federal permitting agency a certification from the State in which the discharge is proposed that states that the

[1] Fish & Game Code §§ 1600 – 1616

[2] California Code of Regulations (C.C.R.), Title 14 § 1.72

discharge will comply with the applicable provisions under the Federal Clean Water Act." In addition to Section 401 of the Federal Clean Water Act, the RWQCB exerts authority over "Waters of the State" and water quality by means of State law. "Waters of the State" are broadly defined by sections of the California Water Code, known as the Porter-Cologne Water Quality Control Act, as "any surface water or groundwater, including saline waters, within the boundaries of the state."[3] In their January 2013 draft policy, the Water Boards (collectively, the SWRCB and RWQCB) define a wetland as follows:

> "An area is a wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area either lacks vegetation or the vegetation is dominated by hydrophytes." (SWCB, 2013).

This definition is similar to an early Federal definition of wetlands (Cowardin et al., 1979), but does not depend on a definition of "hydric soil."

### Federal

At the Federal level, the U.S. Army Corps of Engineers (USACE) regulates placement of "dredge" and "fill" in waters of the U.S. including adjacent wetlands under the authority of Section 404 of the Clean Water Act.[4] The Code of Federal Regulations defines "waters of the U.S." as intrastate lakes, rivers, streams, mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds. Wetlands are defined as "areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Assessment of Federal jurisdiction over a wetland is based on two main factors: 1) nexus or connectivity of the wetland to traditionally navigable waters" or "relatively permanent waters"; and 2) presence of "ordinary high water marks."

[3] California Water Code § 13050(e)
[4] Clean Water Act of 1972 § 404. See also 33 U.S.C. § 1341

Delineation protocols originally described in the USACE 1987 manual required a determination of wetland presence when three criteria were met: hydric soils, hydrophytic vegetation, and wetland hydrology. However, the Federal definition of a wetland evolved after the USACE 1987 manual was published, with refinements developed for specific regions. Protocols in the Arid West supplement to the USACE 1987 manual, which have been preliminarily adopted by the State (SWRCB, 2013), do not require sampling to determine presence of "hydric soil" indicators. Hydric conditions are assumed to be present when there is evidence of wetland hydrology, i.e. evidence that there has been saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USACE, 2008, p.27).

## 3.0 JURISDICTIONAL BOUNDARIES WITHIN SURVEY AREA

Table 1 (following the figures) summarizes our determination of jurisdiction. Figures 3 through 8 show historical topography, current vegetation, jurisdictional limits, and photographs of the plot locations. Completed field data forms are provided in Appendix A.

Rationale for our determination is described in the following sections. In brief, Federal and State jurisdictional areas were found to be limited to two locations: 1) non-wetland, non-tidal Waters along the alignment of the existing concrete channel; and 2) where the proposed new channel daylights at the Ventura River. Parts of these areas consist of unvegetated concrete and riprap, and most of the area delineated within the survey boundaries would not be impacted by the project.

### 3.1 Jurisdiction in Lower Fresno Canyon and Existing Channel

At some point in the past, the streambed in lower Fresno Canyon was converted into an open, rectangular concrete channel. We verified this change with an overlay of a historical USGS topographic map in GIS, which shows that the alignment of the existing concrete channel is close to the historical alignment of a "blue-line" intermittent streambed (Figure 3). No surface water or evidence of saturated soils was observed on the day of the survey. Hydrophytes are limited to a natural channel section upstream of the debris basin, and consist of mulefat (*Baccharis salicifolia*-FAC). Limits of Federal jurisdiction were based on OHWM indicators (shelving) in the

natural channel section, and on the width of the concrete channel (see plot photographs, Figure 7). Limits of State jurisdiction were based on the outer canopy of mulefat vegetation in the natural channel section, and on widths of the debris basin and concrete channel.

### 3.2 Jurisdiction Along Proposed New Channel Outside of Ventura River

Inland from the Ventura River, there is no historical or current evidence of a streambed or wetland within the potential disturbance footprint of the proposed new channel. Topography is such that the historical confluence of Fresno Canyon with the Ventura River, prior to development of Casitas Springs, could have occasionally meandered south to this location. However, currently the proposed alignment of the new channel follows an overgrown shallow swale in uplands, between a near-vertical slope and an unpaved road. This swale, located on private property, originates below Edison Avenue and enters two metal pipes under an old railroad berm on the east side of the Ventura River. This berm now functions as a recreational trail and part of a levee system that artificially confines the Ventura River along its entire length adjacent to Casitas Springs.

Vegetation in the swale consists of a mix of exotic and native vegetation, with hydrophytes limited to a small stand of arroyo willow (*Salix lasiolepis* – FACW) and mulefat about 15 feet from the inlets of the metal culverts. The area immediately adjacent to the culverts is devoid of vegetation and appears to be routinely cleared. Based on abundance of Himalayan blackberry (*Rubus armeniacus*) and other exotics on the slope above the swale, we concluded that the native hydrophytes near the culvert inlets are most likely supported by runoff from irrigation on the adjacent property rather than natural rainfall, and therefore are not indicators of wetland conditions. No OHWM indicators were observed in the swale, and it appears that the culverts were installed in uplands for drainage under the recreational trail. For these reasons we concluded that the swale does not fall under Federal jurisdiction. However, we concluded that State jurisdiction (non-wetland Waters) extends to the limit of the willows because of their adjacency to the outer banks of the Ventura River.

### 3.3 Jurisdiction at the Ventura River

The survey area in the Ventura River has been highly disturbed by a series of historical efforts at flood control (creation of berms that are clearly artificial), and is heavily infested with an invasive exotic, giant reed (*Arundo donax* – FACW). These factors complicated our effort to find clear indicators of OHWM and define limits of Federal jurisdiction. For this reason we based our determination on a combination of historical flood data and aerial photographs. These data indicate that the proposed new channel daylights at a portion of the floodplain that is inundated only during extreme flow events, and therefore is outside of Federal jurisdiction (Figure 5). State jurisdiction (non-wetland Waters) extends to the outer banks of the river and adjacent willows. We concluded non-wetland status for this area because in our experience, willows in general are intolerant of anaerobic (stagnant) conditions. Their presence indicates well-drained, non-hydric soil that supports a riparian community, but not a wetland under the current State definition.

## 4.0 PRELIMINARY IMPACT ANALYSIS AND RECOMMENDATIONS

We conducted a preliminary assessment of potential impacts based on 30 percent design drawings provided by the applicant. As Table 1 shows, our preliminary estimates of jurisdictional areas within the project footprint are as follows:

> State: 0.37 acre non-wetland Waters, of which 0.10 acre is unvegetated and 0.27 acre is occupied by riparian species (willows, mulefat). Most of this vegetation, at the outer limit of the Ventura River floodplain, is heavily infested with giant reed.
>
> Federal: 0.02 acre and 170 linear feet of non-wetland, non-tidal Waters, confined to the inlet area of the proposed new channel. About 30 linear feet (0.004 acre) of this area is occupied by mulefat, the rest is unvegetated.

The new channel will alter natural drainage patterns, in the sense that base flows in lower Fresno Canyon, and most flood flows, will be directed away from their historical course. There will also be permanent loss of riparian vegetation, assuming that the inlet and outlet areas of the new channel will need to be maintained clear of vegetation. Therefore, while the overall impacts are small, the project will require

notification to the California Department of Fish and Wildlife and a Streambed Alteration Agreement. The project will also require water quality certification from the Los Angeles Regional Water Quality Control Board, and pre-construction notification (PCN) to the Los Angeles District of the U.S. Army Corps of Engineers. The applicable Nationwide Permit is #43, "Stormwater Management Facilities". The impact limit for this permit is 0.5 acre and 300 linear feet of non-tidal Waters. The project footprint at the 30 percent design stage fall well below this threshold.

Removal of at least some of the arundo in the Ventura River will favor new growth of native riparian vegetation and be an appropriate mitigation measure for this project. We do not recommend new planting of riparian vegetation as mitigation because there are extensive stands of such vegetation present in the Ventura River. This vegetation is already self-sustaining and will expand once the arundo is removed.

## 5.0 SOURCES CITED

*Collins, J.N., E.D. Stein, M. Sutula, R. Clark, A.E. Fetscher, L. Grenier, C. Grosso, and A. Wiskind, 2008*. California Rapid Assessment Method (CRAM) for Wetlands, v. 5.0.2. 157 pp.

*Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe, 1979*. Classification of Wetlands and Deepwater Habitats of the United States. United States Department of the Interior, Fish and Wildlife Service, FWS/OBS-79/31, December 1979.

*Environmental Laboratory, 1987.* Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Engineers Waterways Experiment Station, Vicksburg, Mississippi.

*Lichvar, R.W. and S.M. McColley, 2008*. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States. A Delineation Manual. U.S. Army Corps of Engineers, Engineer Research and Development Center. Technical report ERDC/CRREL TR-08-12.

*Sawyer, J. T. Keeler-Wolf and J. Evens, 2009*. A Manual of California Vegetation. Second Edition. California Native Plant Society and California Department of Fish and Game.

*State Water Resources Control Board (SWRCB), 2013*. Water Quality Control Policy for Wetland Area Protection and Dredged or Fill Permitting. Preliminary Draft, January 28, 2013.

*U.S. Army Corps of Engineers (USACE), 2001*. Final Summary Report: Guidelines for Jurisdictional Determinations for Waters of the United States in the Arid Southwest. Issued June 2001.

*USACE, 2008*. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). Report No. ERDC/EL TR-08-28, issued September 2008.

*USACE, 2007a*. Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States. Memorandum dated June 5, 2007.

USACE, 2012. National Wetlands Plant List, California. Final Draft issued by the Cold Regions Research and Engineering Laboratory.

*USACE and U.S. Environmental Protection Agency (EPA), 2007b*. Jurisdictional Determination Form Instructional Guidebook.

URS, 2009. Draft Biological Assessment for NMFS: Fresno Canyon Flood Mitigation. Prepared for the Federal Emergency Management Agency, Department of Homeland Security, Oakland, California. June 2009.

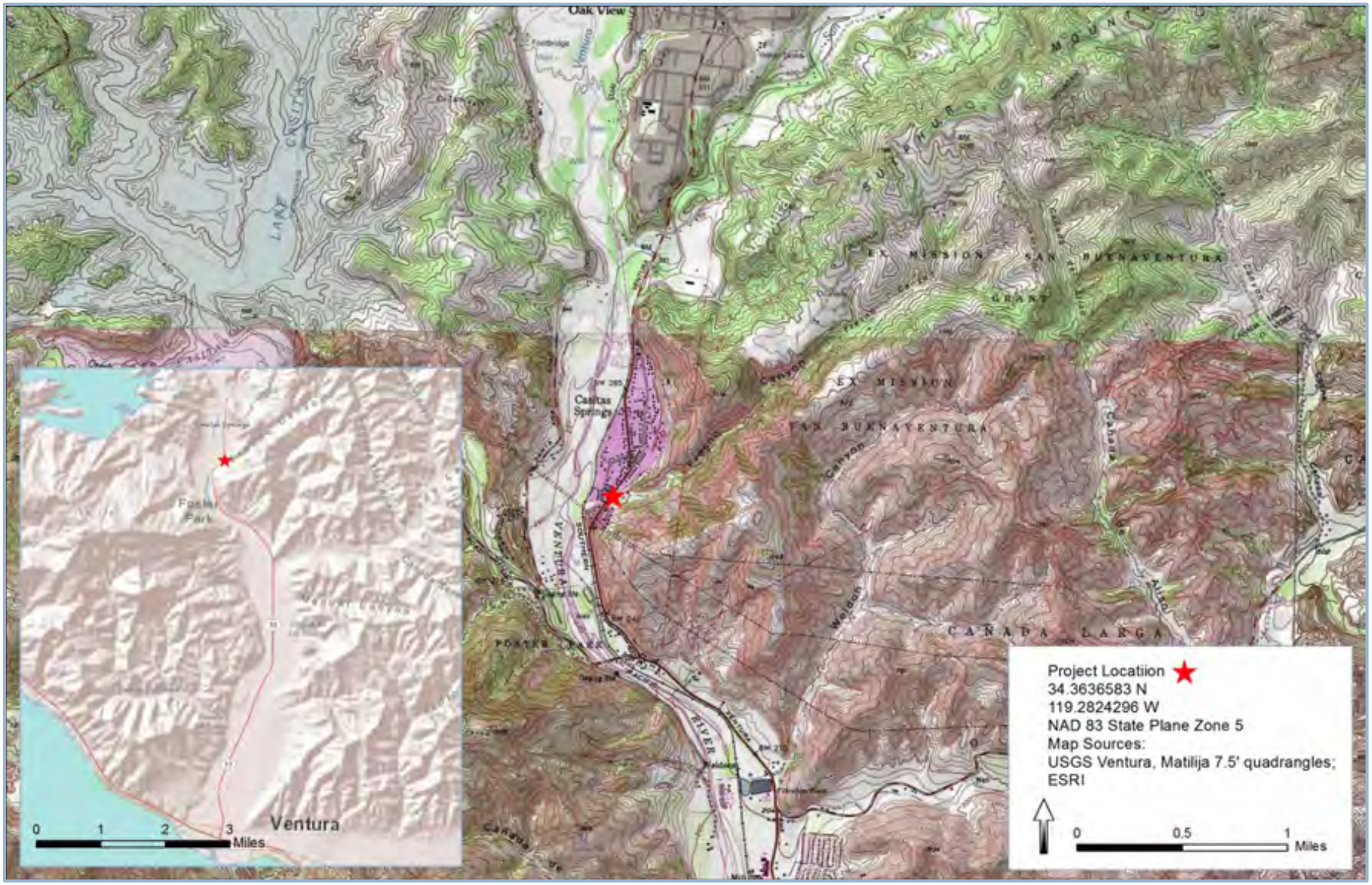



**Figure 1. Project Location**


**Figure 2. Proposed and Existing Channels**

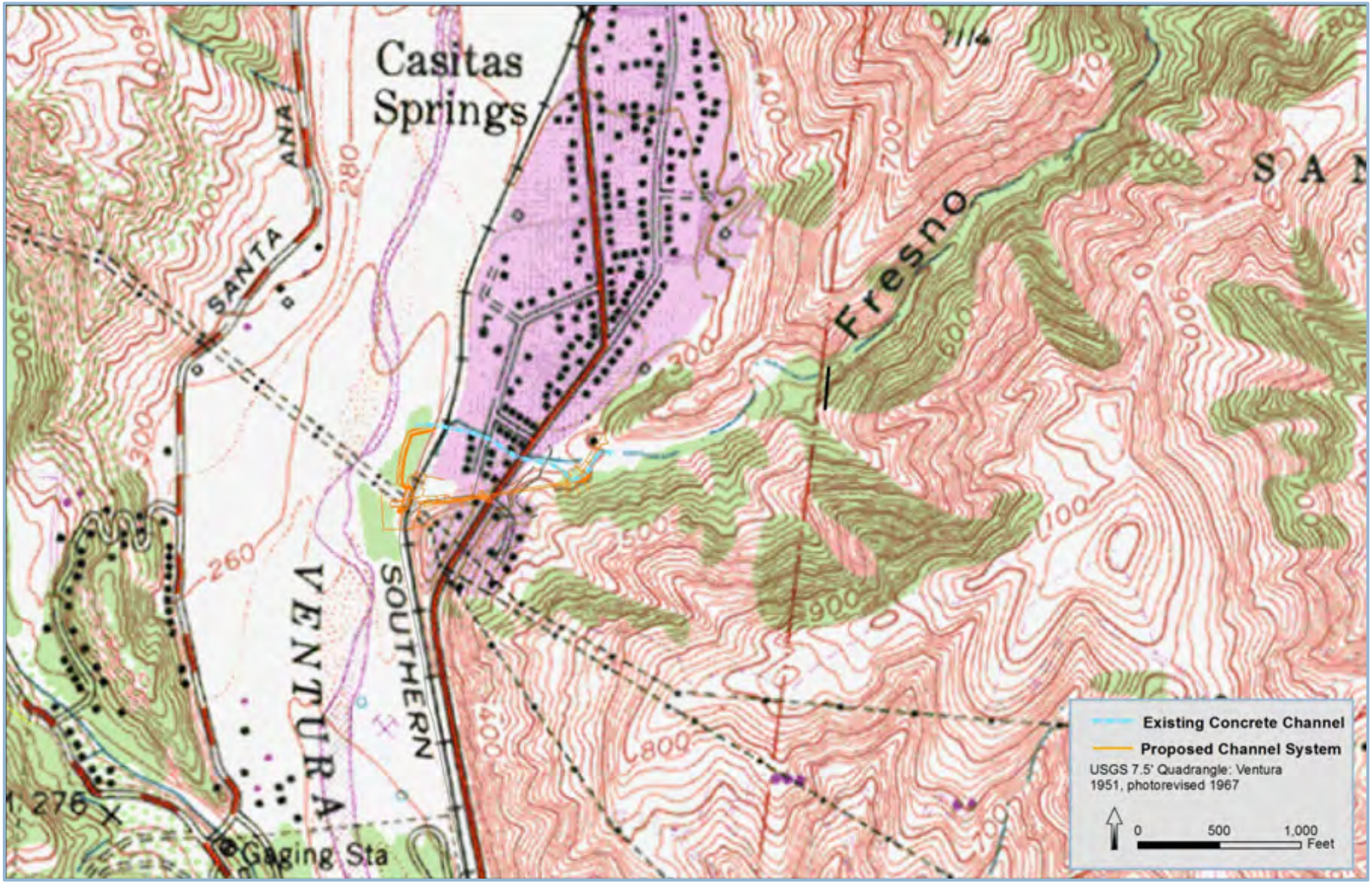



Figure 3. Historical Streambed Alignment Relative to Existing and Proposed Channel

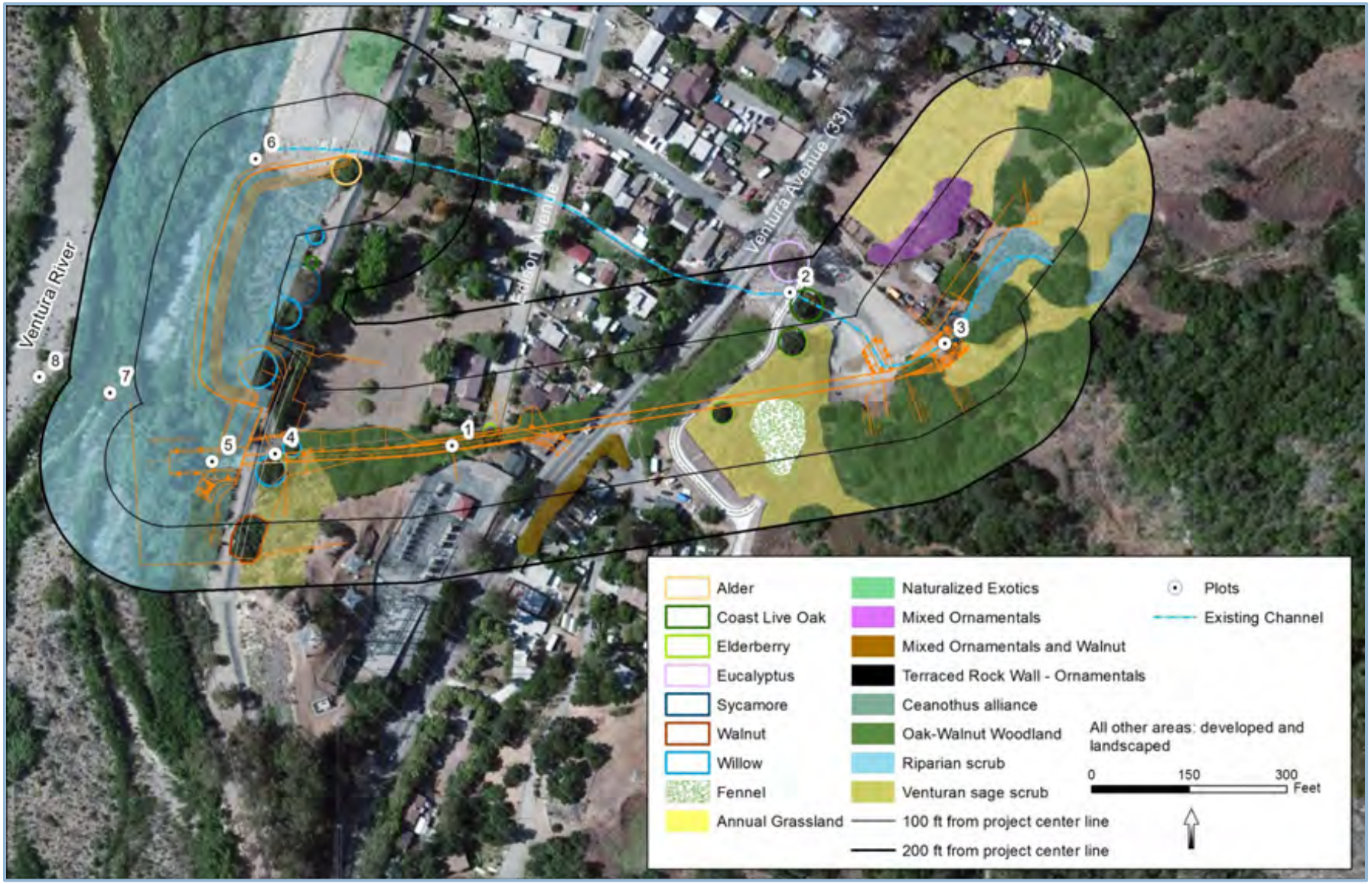
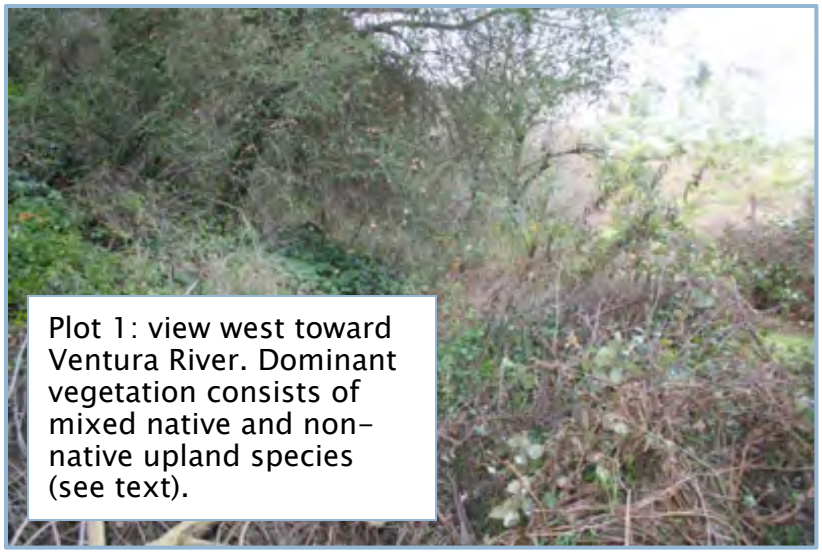



**Figure 4. Vegetation Types and Delineation Plot Locations**


Additional details are provided in Table 1

**Figure 5. Federal and State Jurisdictional Limits**





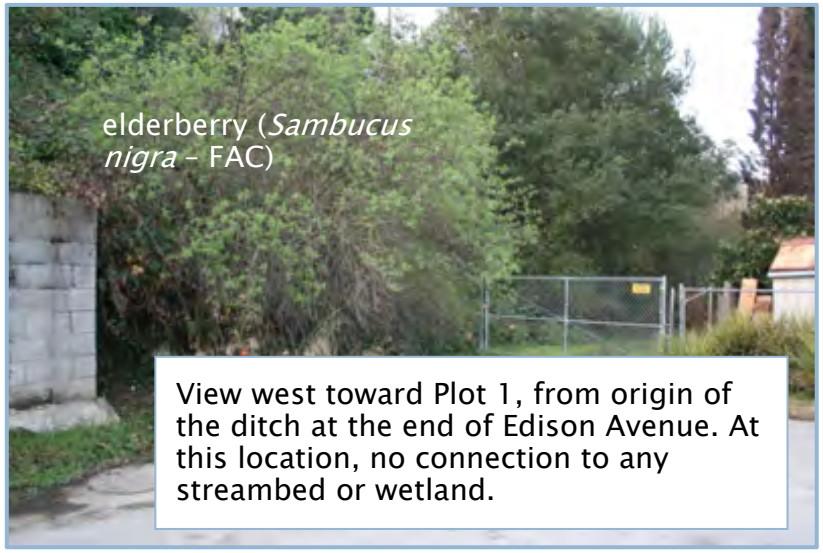
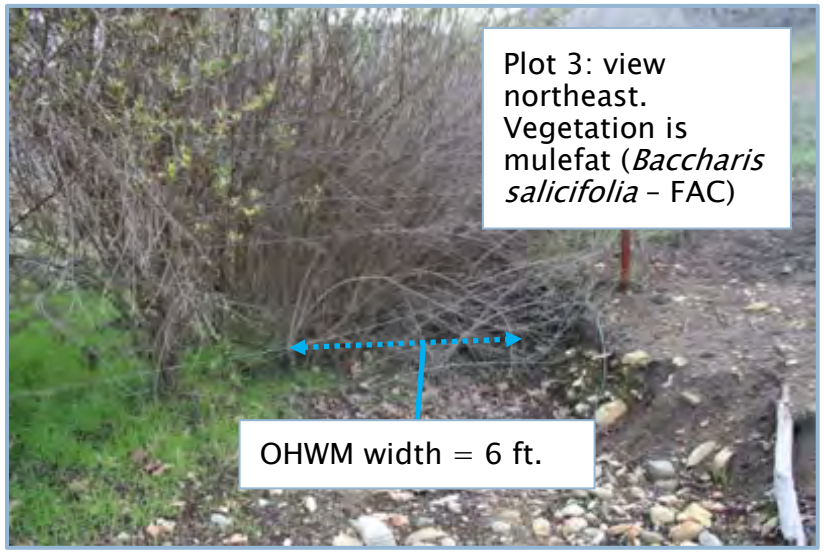




**Figure 6. Photographs of Swale within Alignment of Proposed Channel, Plots 1 and 4**





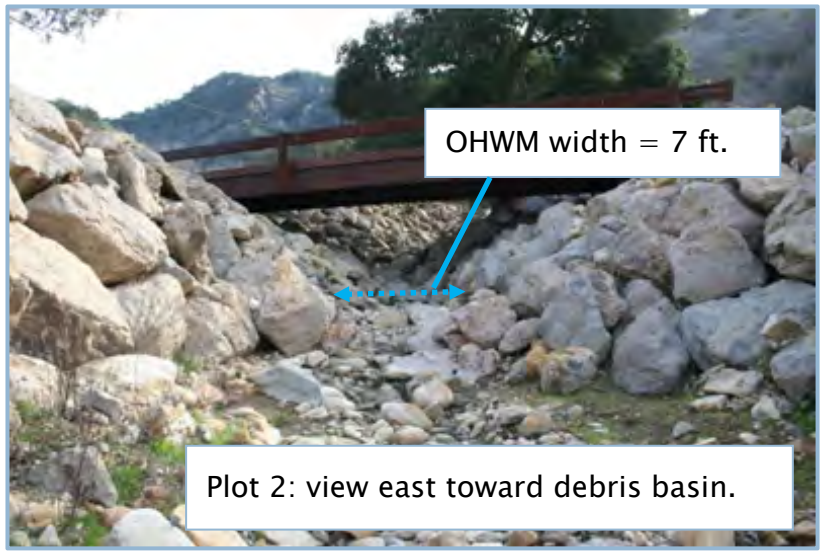
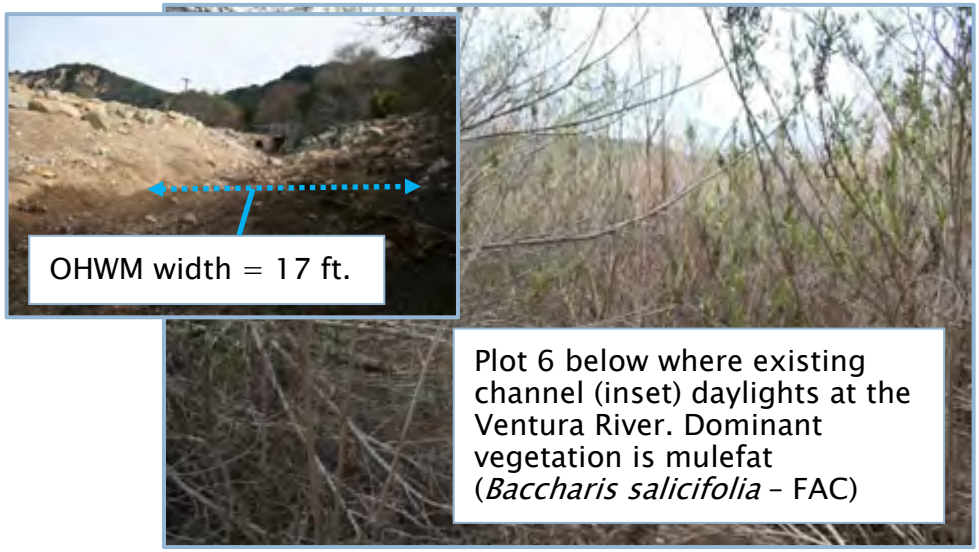
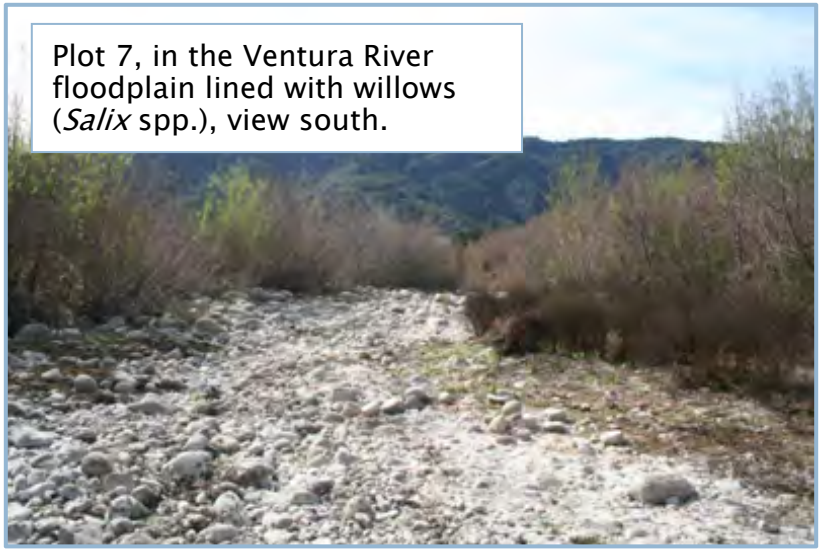




**Figure 7. Existing Channel, Plots 2 and 3**

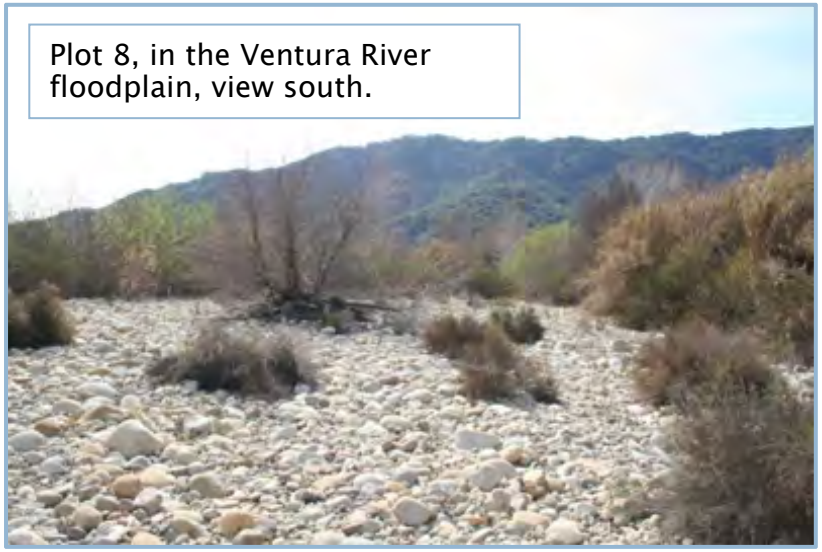




**Figure 8. Ventura River, Plots 5, 6, 7, and 8**

## Table 1. Summary of Jurisdiction Within Estimated Project Limits

| Project Component | Description of Jurisdiction | Jurisdiction within Project Work Limits* | |
|---|---|---|---|
| | | State | Federal |
| Existing Fresno Canyon channel and debris basin | Non-wetland Waters throughout along the historical alignment of the Fresno Canyon intermittent streambed. Unvegetated riprap and an open concrete box extend from debris basin to the Ventura River. Channel daylights outside of, and above, OHWM of Ventura River. | 0.11 acre total non-wetland Waters, of which 0.01 acre is vegetated (mulefat) | 170 linear feet x 6 feet width between OHWM = 1,020 square feet = 0.02 acre non-wetland Waters, of which 30 linear feet (0.004 acre) is vegetated (mulefat). |
| Proposed alignment of new channel | Non-wetland, limited to west end – see Figure 5 | 0.26 acre total non-wetland Waters. Vegetation is mixed willows and arundo. | No Federal jurisdiction – outside OHWM of Ventura River |
| **TOTAL JURISDICTIONAL AREA POTENTIALLY AFFECTED** | | 0.37 acre | 170 linear feet, 0.02 acre |

* Preliminary estimates based on 30 percent design drawings.

# Appendix 1

## Wetland Data Forms (Arid West)

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Casitas Springs/Fresno Cyn City/County: Casitas Springs/Ventura Sampling Date: 1-29-2013

Applicant/Owner: Ventura County Watershed Protection District State: CA Sampling Point: 1

Investigator(s): E. Read Section, Township, Range: T3N R23W not numbered

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): Lat: 34.363062 Long: -119.309183 Datum: NAD 83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation X, Soil X, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

-see JD report

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes N/A | No X | **Is the Sampled Area within a Wetland?** Yes No X |
| Hydric Soil Present? | Yes | No X | |
| Wetland Hydrology Present? | Yes | No X | |

Remarks: swale in uplands, between steep slope and unimproved road

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30 ft²) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Quercus agrifolia | 10 | no | NI |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | = Total Cover | | |
| **Herb Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | = Total Cover | | |
| **Woody Vine Stratum** (Plot size: 30 ft²) | | | |
| 1. exotics: ivy, vinca, H. blackberry | 100 | | NI |
| 2. | | | |
| | = Total Cover | | |

% Bare Ground in Herb Stratum % Cover of Biotic Crust

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: (A)

Total Number of Dominant Species Across All Strata: (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species | x 1 = |
| FACW species | x 2 = |
| FAC species | x 3 = |
| FACU species | x 4 = |
| UPL species | x 5 = |
| Column Totals: (A) | (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

__ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes No X

Remarks:

**SOIL** Not Sampled

Sampling Point: 1

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** Yes _____ No _____

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:** None

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fresno Cyn City/County: Casitas Springs/Ventura Sampling Date: 1-29-2013

Applicant/Owner: Ventura County Watershed Protection District State: CA Sampling Point: 2

Investigator(s): E. Read Section, Township, Range: T3N R23W not numbered

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): Lat: 34.363719 Long: -119.307467 Datum: Nad 83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation X, Soil X, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

- see JD report

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes | No X | **Is the Sampled Area within a Wetland?** Yes No X |
| Hydric Soil Present? | Yes | No X | |
| Wetland Hydrology Present? | Yes | No X | |

Remarks: Plot is barren, Location 3 in an artificial channel downstream of a debris basin

## VEGETATION – Use scientific names of plants. not vegetated

| Tree Stratum (Plot size: ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | = Total Cover | | |
| **Herb Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | = Total Cover | | |
| **Woody Vine Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| | = Total Cover | | |

% Bare Ground in Herb Stratum % Cover of Biotic Crust

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: (A)

Total Number of Dominant Species Across All Strata: (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species | x 1 = |
| FACW species | x 2 = |
| FAC species | x 3 = |
| FACU species | x 4 = |
| UPL species | x 5 = |
| Column Totals: (A) | (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

__ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes No X

Remarks:

**SOIL** not sampled  Sampling Point: 2

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** Yes _____ No _____

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:** none

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fresno Cyn City/County: Castaic Springs / Ventura Sampling Date: 1-29-2013

Applicant/Owner: Ventura County Watershed Protection District State: CA Sampling Point: 3

Investigator(s): E. Read Section, Township, Range: T3N R23W not numbered

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation X, Soil X, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

- see JD report

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No _____ | Is the Sampled Area within a Wetland? Yes _____ No X |
| Hydric Soil Present? | Yes _____ | No X | |
| Wetland Hydrology Present? | Yes _____ | No X | |

Remarks: Significantly disturbed as part of debris basin maintenance

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30 ft²) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 30 ft²) | | | |
| 1. Baccharis salicifolia | 50 | Y | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | = Total Cover | | |
| **Herb Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| | = Total Cover | | |

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No _____

Remarks: half of plot is cleared, as part of debris basin maintenance

**SOIL** not sampled  Sampling Point: 3

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** Yes _____ No _____

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:** none

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

page 9

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fresno Cyn City/County: Castaic Springs / Ventura Sampling Date: 1-29-2013

Applicant/Owner: Ventura County Watershed Protection District State: CA Sampling Point: 4

Investigator(s): E. Read Section, Township, Range: T3N R23W not numbered

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes Y No (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation X, Soil X, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No | **Is the Sampled Area within a Wetland?** Yes No X |
| Hydric Soil Present? | Yes No X | |
| Wetland Hydrology Present? | Yes No X | |

Remarks: Swale in uplands, near inlets to culverts

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30 ft²) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Salix lasiolepis | 30 | X | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: ) | | | |
| 1. Baccharis salicifolia | 10 | N | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | = Total Cover | | |
| **Herb Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | = Total Cover | | |
| **Woody Vine Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| | = Total Cover | | |

% Bare Ground in Herb Stratum % Cover of Biotic Crust

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species | x 1 = |
| FACW species | x 2 = |
| FAC species | x 3 = |
| FACU species | x 4 = |
| UPL species | x 5 = |
| Column Totals: (A) | (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

X Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No

Remarks: About 50% of plot is unvegetated, most likely related to culvert maintenance. Vegetation likely supported by off-site irrigation

**SOIL** Not sampled

Sampling Point: 4

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** Yes _____ No _____

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:** none

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fresno Cyn City/County: Casitas Springs/Ventura Sampling Date: 1-29-2013

Applicant/Owner: Ventura County Watershed Protection Distrct State: CA Sampling Point: 5

Investigator(s): E Head Section, Township, Range: T3N R23W not numbered

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): Lat: 34.362977 Long: -119.310410 Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation X, Soil X, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

- See JD report

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No | Is the Sampled Area within a Wetland? Yes No X |
| Hydric Soil Present? | Yes | No X | |
| Wetland Hydrology Present? | Yes | No X | |

Remarks: At base of culvert outlet

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30 ft²) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Salix lasiolepis | 50 | Y | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: ) | | | |
| 1. Arundo donax | 40 | Y | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | = Total Cover | | |
| **Herb Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | = Total Cover | | |
| **Woody Vine Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| | = Total Cover | | |

% Bare Ground in Herb Stratum % Cover of Biotic Crust

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species | x 1 = |
| FACW species | x 2 = |
| FAC species | x 3 = |
| FACU species | x 4 = |
| UPL species | x 5 = |
| Column Totals: (A) | (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

X Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No

Remarks: half of plot unvegetated, most likely due to culvert maintenance

**SOIL** not sampled  Sampling Point: 5

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** Yes _____ No _____

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:** none

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fresno Cyn City/County: Carpinteria Springs/Ventura Sampling Date: 1-29-2013
Applicant/Owner: Ventura County Watershed Protection District State: CA Sampling Point: 6
Investigator(s): E Read Section, Township, Range: T3N R23W not numbered
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): <1
Subregion (LRR): Lat: 34.364250 Long: -119.310197 Datum: NAD83
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)
Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No ____ | **Is the Sampled Area within a Wetland?** Yes ____ No X |
| Hydric Soil Present? | Yes ____ No X | |
| Wetland Hydrology Present? | Yes ____ No X | |

Remarks: Plot is at base of a rip-rap slope, east bank of Ventura River

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: ____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | ____ = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 30 ft²) | | | |
| 1. Baccharis salicifolia | 90 | Y | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | ____ = Total Cover | | |
| **Herb Stratum** (Plot size: ____) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | ____ = Total Cover | | |
| **Woody Vine Stratum** (Plot size: ____) | | | |
| 1. | | | |
| 2. | | | |
| | ____ = Total Cover | | |

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

**Dominance Test worksheet:**
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species ____ | x 1 = ____ |
| FACW species ____ | x 2 = ____ |
| FAC species ____ | x 3 = ____ |
| FACU species ____ | x 4 = ____ |
| UPL species ____ | x 5 = ____ |
| Column Totals: ____ (A) | ____ (B) |

Prevalence Index = B/A = ____

**Hydrophytic Vegetation Indicators:**
X Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No ____

Remarks:

**SOIL** not sampled  Sampling Point: 6

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains  [2]Location: PL=Pore Lining, M=Matrix

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** Yes _____ No _____

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:** none

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fresno Cyn City/County: Cas, Thousand Oaks/Ventura Sampling Date: 1-29-2013

Applicant/Owner: Ventura County Watershed Protection District State: CA Sampling Point: 7

Investigator(s): E Read Section, Township, Range: T3NR23W not numbered

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): Lat: 34.363256 Long: -119.310935 Datum: NAD 83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No | **Is the Sampled Area within a Wetland?** Yes No X |
| Hydric Soil Present? | Yes | No X | |
| Wetland Hydrology Present? | Yes | No X | |

Remarks:

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 50 ft²) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Salix spp | 50 | Y | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | = Total Cover | | |
| **Herb Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | = Total Cover | | |
| **Woody Vine Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| | = Total Cover | | |

% Bare Ground in Herb Stratum % Cover of Biotic Crust

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: (A)

Total Number of Dominant Species Across All Strata: (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: | |
|---|---|---|
| OBL species | x 1 = | |
| FACW species | x 2 = | |
| FAC species | x 3 = | |
| FACU species | x 4 = | |
| UPL species | x 5 = | |
| Column Totals: (A) | | (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No

Remarks: half of the plot is unvegetated terrace in floodplain of Ventura River

**SOIL** not sampled  Sampling Point: 7

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** Yes _____ No _____

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:** none

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Page 15

## WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fresno Cyn City/County: Casitas Springs/Ventura Sampling Date: 1-29-2013
Applicant/Owner: Ventura County Watershed Protection District State: CA Sampling Point: 8
Investigator(s): E Read Section, Township, Range: T3N R23W not mentioned
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): <1%
Subregion (LRR): Lat: 34.363316 Long: -119.311294 Datum: NAD83
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

see JD report

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No | Is the Sampled Area within a Wetland? Yes No X |
| Hydric Soil Present? | Yes No X | |
| Wetland Hydrology Present? | Yes No X | |

Remarks:

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 50 ft²) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Salix spp | 40 | Y | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: ) | | | |
| 1. Lepidospartum squamatum | 5 | N | FACU |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | = Total Cover | | |
| **Herb Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | = Total Cover | | |
| **Woody Vine Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| | = Total Cover | | |

% Bare Ground in Herb Stratum % Cover of Biotic Crust

**Dominance Test worksheet:**
Number of Dominant Species That Are OBL, FACW, or FAC: (A)
Total Number of Dominant Species Across All Strata: (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species | x 1 = |
| FACW species | x 2 = |
| FAC species | x 3 = |
| FACU species | x 4 = |
| UPL species | x 5 = |
| Column Totals: (A) | (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No

Remarks:

**SOIL** not sampled

Sampling Point: 8

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** Yes _____ No _____

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:** none

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

**Wetland Hydrology Present?** Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

aerial photos indicate flooding during extreme events

Remarks:

+ flood data