

State of California
The Resources Agency
Department of Water Resources
Division of Planning and Local Assistance

Mitigated Negative Declaration and Initial Study for the Sutter Bypass East Borrow Canal Water Control Structures Project

Department of Water Resources
June 2008

Arnold Schwarzenegger
Governor
State of California

Michael Chrisman
Secretary of Resources
The Resources Agency

Lester Snow
Director
Department of Water Resources

State of California

**The Resources Agency
Department of Water Resources**

**Proposed Mitigated Negative Declaration for the Sutter Bypass East Borrow Canal Water
Control Structures Project**

Project Description: The California Department of Water Resources (DWR) proposes the replacement of two existing weirs and their associated fish ladders on the East Borrow Canal (EBC) of the Sutter Bypass with new structures that will improve weir operational safety and efficiency and improve anadromous fish passage at each site. Weir No. 2 and Willow Slough Weir will each be replaced with a new structure on the same site as the existing weir, which will perform the same functions as the existing weir. Construction will occur over two seasons, from May to October of 2009, and from May to October of 2010.

The proposed project involves two separate sites on the EBC. Weir No. 2 and Willow Slough Weir impound water at two different points on the EBC, 14 miles apart, to maintain water surface elevations on the EBC that are adequate for irrigation diversions by water-right holders.

Weir No. 2 and Willow Slough Weir, which are owned, operated, and maintained by DWR, are important parts of the water management system of the Sutter Bypass, but neither is functioning effectively due to structural deterioration, inadequate design, and sediment erosion and deposition. In addition to these physical deficiencies, these weirs are also the last major barriers to anadromous fish migration in the entire Butte Creek system, a significant salmon spawning stream of which the Sutter Bypass is a part. DWR proposes to replace both weirs and both fish ladders to improve water control and fish passage conditions.

Weir No. 2 is a concrete structure built in 1946 to replace a timber flashboard dam constructed in 1925 that was washed out by floods, built on the original 1925 foundation. The concrete piers create twelve bays containing wooden flashboards that are used to control the upstream water elevation, and a pool and weir fish ladder with a capacity of 13 cfs exists at the right abutment. The Weir No. 2 structure has been in place for more than 50 years and wear and deterioration has taken a toll on the structure to the point that maintaining a normal upstream operating stage for diversions and a fish ladder may not be possible during low-flow periods. The structure leaks excessively, and a DWR structural analysis in July 2001 discovered a large hole in the apron on the downstream side of weir, necessitating the replacement of Weir No. 2. The existing weir is also an operational hazard because it relies on flashboards that are manually placed and removed from a narrow walkway, which exposes personnel to possible injury with every flow adjustment.

This project proposes to remove the existing weir and fish ladder and replace them with new structures that are more effective and safer to operate. On the same site, DWR will construct a new weir that has the same dimensions as the existing weir, and a new fish ladder on the bank opposite the existing fish ladder. The new weir will have three main channels, which utilize remotely operated inflatable Obermeyer gates to control water levels upstream in the EBC, and six side bays controlled by manually removable flashboards. The new fish ladder will be a Full ice-harbor design which will operate within a wider range of flows. This design was chosen after an analysis of conditions and needs at the site by DWR, Department of Fish and Game (DFG) and NOAA Fisheries staff.

Willow Slough Weir is an earthen dam constructed between 1924 and 1925 to control water levels in the EBC for agricultural diversions. The structure has two 60-inch diameter corrugated metal pipe culverts and one 60-inch diameter concrete culvert that convey flow, controlled by slide gates, from the lower end of the EBC into Willow Slough; and a Denil fish ladder that was constructed in the 1980s to provide anadromous fish passage.

The existing fish ladder, which has a capacity of 90 cubic feet per second (cfs), does not provide effective anadromous fish passage due to incorrect elevation of the entrance, confusing attraction flows from the main weir culverts, and excessive upstream debris accumulation. In addition, the existing culverts are undersized with respect to the planned operational flows from the EBC into Willow Slough.

This project proposes to remove the existing fish ladder and culverts and replace them with new structures whose design and configuration provide better flow control from the EBC into Willow Slough, and provide effective fish passage between the two waterways. Four new corrugated metal pipe culverts will be installed to provide more flow capacity, and a new Pool and Chute fish ladder, which will operate through a greater range of flows from 6 cfs to 270 cfs, will be constructed through the weir. The fish ladder design was the alternative chosen after an analysis of conditions and needs at the site by DWR, DFG and NOAA Fisheries staff.

The specific objectives of this project are to:

- 1) Replace the existing manually operated Weir No. 2 flashboard structure with a remotely operated gate structure that is safer and more effective to operate.
- 2) Reconstruct the earthen Willow Slough Weir and replace its culverts to improve flow of water from the EBC into Willow Slough.
- 3) Replace the fish ladders at both weirs to improve passage for migrating Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*Oncorhynchus mykiss*).

DWR will minimize impacts to the environment due to project activities by adopting specific conservation and mitigation measures. DWR will protect natural resources from project activities by adopting erosion control and water quality protection measures.

During construction, all flow will continue down the EBC past the isolated Weir No. 2 construction site. ~~A flow between~~ The range of flows expected in Willow Slough, while operating at normal water surface levels in the EBC of 27.5 ft to 29.5 ft, is 15 cfs to 123 cfs. However, when sufficient water supply is available, a flow of at least 40 cfs will be conveyed down Willow Slough. ~~40 cfs and 100 cfs will be diverted around Willow Slough Weir, when it is available.~~ If stages in the EBC cannot be maintained at or above 27.5 ft., DFG will be notified, the temporary fish ladder will be closed, and no flow from the EBC will enter Willow Slough per existing low flow operations. Construction materials and equipment will be delivered to the Weir No. 2 site via Highway 99 to Bogue Road, to McClatchy Road, to Weir No. 2. Concrete trucks, dump trucks, loaders, backhoes, tractors with flatbed trailers, and assorted personnel vehicles will be used at the site.

Construction material and equipment will be delivered to the Willow Slough Site via Sacramento Avenue from Highway 99, to the east side levee of the EBC in the Sutter Bypass, where the Sacramento Avenue Bridge crosses over the EBC to reach the Willow Slough Weir.

During non-work periods (night-time, holidays, Sundays, etc.), the construction equipment and vehicles will be stored in designated staging areas. Equipment that has the potential to leak oil or other pollutants and contaminants (backhoes, trucks, etc.) will have containment devices to prevent spill from entering the environment. All contractors will follow a set of Environmental Protection Guidelines developed by the Department of Water Resources. State and federal environmental statutes, rules, regulations, and polices will be followed to protect environmental resources. All construction activities shall be in accordance with environmental and regulatory permits issued for the project and all contractors will be held responsible for any violations as prescribed by law. All contractors will be responsible for the control of construction activities, maintenance of equipment, and conduct of their employees at the work site to reduce or eliminate identified environmental impacts.

Project location: The Sutter Bypass East Borrow Canal Water Control Structures Project consists of two sites in Sutter County along the East Borrow Canal (EBC) of the Sutter Bypass.

Weir No. 2 is approximately 27 miles upstream of the confluence of the Sacramento and Feather Rivers, just north of the intersection of the east side Sutter Bypass levee and McClatchy Road, Sutter County, CA; T15N R2E S33, Mount Diablo Meridian; UTM coordinates (NAD83, zone 10): northing 4328907.852, easting 607309.9909; and appears on the “Tisdale Weir” USGS 7.5 minute quadrangle. Access to the site is via Highway 99 to Bogue Road, to McClatchy Road, to Weir No. 2.

The Willow Slough Weir project area is located immediately downstream of the Sacramento Avenue Bridge over the EBC, approximately 15 miles south of Yuba City; Sutter County, CA; T12N R3E S3, Mount Diablo Meridian; UTM coordinates (NAD83, zone 10): northing 4308262.1678, easting 619231.2612; and appears on the “Sutter Causeway” and “Nicolaus” USGS 7.5-minute quadrangles. Access to the site is via Sacramento Avenue from Highway 99, to the east side levee of the EBC in the Sutter Bypass, where the Sacramento Avenue Bridge crosses over the EBC to reach the Willow Slough Weir.

Project Proponent: Department of Water Resources
Division of Flood Management
3310 El Camino Ave.
Sacramento, CA 95821

Finding: The project, which includes the mitigation measures described in the attached Initial Study, will have a less than significant impact on the environment.

Basis for Finding: Based on the Initial Study (attached) and the mitigation measures that the Department of Water Resources is committed to implement, ~~no significant~~ any impact will that occurs as a result of this project will be less than significant. Implementation of the mitigation measures described in the Initial Study and listed below will prevent potentially significant adverse impacts to utilities and service systems. ~~Additional mitigation measures will further reduce less than significant impacts to biological resources, hydrology and water quality, and recreation~~ to a less than significant level. Contractors will follow guidelines prescribed by

Department of Water Resources' engineers and environmental scientists to avoid or minimize adverse project impacts on the environment. (Note: This paragraph has been revised to ensure consistency with the Initial Study.)

Mitigation Measures:

- Fish Passage: At Weir No. 2 the existing fish ladder will operate until the new fish ladder is complete. At Willow Slough Weir, a temporary fish ladder will operate until the new fish ladder is complete.
- Fish Rescue and Relocation: DWR will rescue fish from cofferdammed construction areas by using seines and dipnets. Fish relocation operations are expected to minimize project impacts to all special-status fish species by removing them from areas where they would have experienced high rates of injury or mortality.
- ~~Water Conveyance: Normal flows will continue past construction areas to provide baseline conditions to aquatic resources downstream. (Note: Although flow will still continue past construction areas, water conveyance is not considered mitigation. Therefore, we have removed it from our list of Mitigation Measures)~~
- ~~Storm Water Pollution Prevention Plan (SWPPP) and a Spill Prevention and Countermeasure Plan: The implementation of a SWPPP and a Spill Prevention and Countermeasure Plan will greatly reduce the potential for these adverse effects to occur by implementing the best available preventative measures. (Note: SWPPP and other erosion control measures have been incorporated as part of the project description and are not considered mitigation. Therefore, we have removed it from our list of Mitigation Measures)~~
- Verify new fish ladder designs meet engineering specifications: The fish ladder designs were approved by NOAA Fisheries and DFG. DWR surveyors will ensure that ladders are built according to DFG and NOAA Fisheries-approved specifications.
- Verify hydraulic conditions in new fish ladders meet fish passage criteria: Physical measurements will be taken to verify that fish ladders meet NOAA Fisheries and DFG fish passage criteria for target fish species and lifestages.
- Verify fish are successful in navigating through fish ladder: Underwater imagery will be used to show successful passage of adult salmonids. The details of the fisheries monitoring plan will be created according to NOAA Fisheries needs.
- Pre-construction avian surveys will be conducted in the project area. If nests are found within or near the project area, DWR will consult with USFWS and/or DFG to implement protective measures.
- Obtain pre-project photographs of project area and surroundings: DWR will establish a baseline of conditions prior to construction activities
- Determine species composition and stand characteristics of existing vegetation that will be impacted: DWR will ~~determine~~ **establish** goals for the revegetation effort
- Mark off areas of vegetation that are to be avoided by construction machinery: DWR will restrict work areas to reduce impacts to vegetation from machinery and personnel.

- Conduct weekly inspection **daily during the regular work week** to ensure areas outside construction area have remained undisturbed: Inspections will reduce the chance of accidental disturbance.
- Re-plant riparian vegetation, with appropriate irrigation capabilities, at Willow Slough Weir: DWR will re-establish riparian and shaded riverine aquatic habitats.
- Conduct post-project monitoring surveys of re-planted vegetation: DWR will count and measure planted riparian vegetation to determine survivorship, species composition, and canopy cover **to ensure that they meet revegetation goals**.
- Restrict work windows to Giant Garter Snake (GGS) active season: The selected work window will avoid inactive (hibernating) snakes that could be injured by construction while they are unable to escape from underground dens
- Conduct an environmental awareness training session for construction personnel: A US Fish and Wildlife Service (USFWS) approved biologist will instruct workers on how to identify Giant Garter Snakes and their habitat, how they can minimize take of the snake, what to do if they encounter a snake, and any additional terms of environmental documents obtained for the project.
- Construction sites in streambeds will be dewatered for at least 15 days prior to start of construction in areas with Giant Garter Snake habitat: Dewatering will encourage any resident Giant Garter Snakes to leave the aquatic portion of the construction area.
- Project area will be surveyed for Giant Garter Snakes: A biological monitor will be available to determine if snakes are present in construction area. Surveys will be repeated if a lapse in construction activity of two weeks or greater occurs.
- If a Giant Garter Snake is observed, construction activities will be redirected to another portion of the project area until the snake has moved away on its own: This action will avoid take of Giant Garter Snakes.
- No plastic, monofilament, jute, or similar erosion matting that could entangle snakes will be used on the project site: This action will avoid injury to Giant Garter Snakes.
- The worksite will be kept free of trash that could attract predators of Giant Garter Snakes to the area: This action will avoid increasing predation on Giant Garter Snakes.
- After completion of construction activities, any temporary fill and construction debris will be removed: All uplands involved in the project (staging areas, construction sites, access roads, levees) will be restored using a native grass and forb seed mixture. This action will restore Giant Garter Snake habitat to pre-construction conditions.
- **Mitigation credits for Giant Garter Snake habitat will be purchased to compensate for any loss in habitat. (Note: This statement is added to be consistent with the mitigation described in the Initial Study).**
- Conduct post-project monitoring surveys of re-seeded upland areas: DWR will measure cover and species composition to monitor revegetation and re-seed if necessary.

This document reflects the independent judgment of the Department of Water Resources. The Mitigated Negative Declaration is filed pursuant to Section 15072 of the Guidelines for Implementation of the California Environmental Quality Act. Copies of the Mitigated Negative Declaration and Initial Study, as well as documents referenced therein, are available for review at <http://www.watershedrestoration.water.ca.gov/fishpassage/> or by calling Harry Spanglet at (916) 651-9608.



Keith E. Swanson, Principal Engineer
Division of Flood Management

Date 9/16/08

Initial Study
for
Sutter Bypass East Borrow Canal Water Control Structures

Prepared by:

Division of Planning and Local Assistance
Department of Water Resources
June 2008

TABLE OF CONTENTS

Mitigation Measures:.....	5
Executive Summary	3
I. Introduction	3
II. Project Description	4
Project Components.....	7
Required Permits, Approvals and Decisions	24
III. Environmental Setting	26
Location	26
Climate	26
Geography	27
Vegetation and Habitats	28
Fish	28
Wildlife.....	30
Special Status Species	30
IV. Impacts and Mitigation Measures	35
Aesthetics	35
Agricultural Resources.....	37
Air Quality	38
Biological Resources	39
Cultural Resources.....	52
Geology and Soils	53
Hazards and Hazardous Materials.....	55
Hydrology and Water Quality	57
Land Use and Planning	64
Mineral Resources	65
Noise	66
Population and Housing	68
Public Services.....	69
Recreation.....	70
Traffic and Transportation.....	71
Utilities and Service Systems.....	75
Mandatory Findings of Significance	77
V. Determination.....	79
Agencies Consulted	80
References.....	80

List of Appendices..... 82

LIST OF FIGURES

Figure 1. Map of Project Locations within Sutter Bypass 6
 Figure 2. Weir No. 2 Project Area 10
 Figure 3. Access Routes to Weir No. 2..... 11
 Figure 4. Proposed Locations of Utility Poles at Weir No. 2 12
 Figure 5. Improvement to Access Road at Weir No. 2..... 13
 Figure 6. Willow Slough Weir Project Area..... 17
 Figure 7. Access Route to Willow Slough Weir..... 18
 Figure 8. Temporary Fish Passage at Willow Slough Weir..... 19
 Figure 9. Proposed Temporary Railcar Bridge at Willow Slough..... 20
 Figure 10. Existing Riparian Vegetation on Downstream side of Willow Slough Weir..... 21
 Figure 11. Occurrences of Special-Status Species (CNDDDB) in the Weir No. 2 Project Area. . 22
 Figure 12. Occurrences of Special-Status Species (CNDDDB) in the Willow Slough Weir Project Area..... 23
 Figure 13. Soils of the Project Area..... 54
 Figure 14. Existing Fish Ladder and Culverts at Willow Slough Weir 59

LIST OF TABLES

Table 1. Fish Species Occurring in the Sutter Bypass 29
 Table 2. Special-Status Species in the Sutter Bypass Weirs Replacement Project Area..... 31

Executive Summary

The California Department of Water Resources (DWR) proposes the Sutter Bypass East Borrow Canal Water Control Structures Project, which is the replacement of two existing weirs and their associated fish ladders on the East Borrow Canal (EBC) of the Sutter Bypass. The proposed new structures will improve weir operational safety and efficiency and improve anadromous fish passage at each site.

Weir No. 2 and Willow Slough Weir are located at two different sites on the EBC that are 14 miles apart. These weirs maintain water surface elevations on the EBC that are sufficient for irrigation diversions by water-right holders. Both weirs have fish ladders to provide passage for anadromous fish.

These weirs and fish ladders are deteriorating and are not functioning adequately. Weir No. 2 has significant structural issues, and its fish ladder does not operate well. Willow Slough Weir does not provide adequate water control capabilities, and its fish ladder is poorly designed and has very limited functionality.

DWR proposes to replace each of the existing weirs with a new structure on the same site that will perform the same functions as the existing weir but with improved capabilities and efficiency. DWR will also replace the existing inadequate fish ladders with improved fish ladders that have been carefully designed for maximum utility.

This Initial Study has been prepared by the California Department of Water Resources, Division of Planning and Local Assistance. On the basis of this study it is determined that the proposed project with the incorporation of the identified mitigation measures will not have a significant effect on the environment.

I. Introduction

Project Objective

The project involves the replacement of two existing weirs and their associated fish ladders on the East Borrow Canal (EBC) of the Sutter Bypass with new structures that will improve weir operational safety and efficiency and improve anadromous fish passage at each site. Weir No. 2 and Willow Slough Weir will each be replaced with a new structure on the same site as the existing weir, which will perform the same functions as the existing weir (Figure 1).

Background

Declining salmon and steelhead populations have led to increased efforts to implement restoration activities to preserve and enhance their populations, while respecting the needs of the

various stakeholders. More than \$25 million has been invested in fish passage and screening projects in the middle reaches of Butte Creek, resulting in dramatic increases in returning adult anadromous fish populations. The continued success of those projects can be assured through completion of fish passage improvements in the lower reaches of the complex Butte Creek system.

The Sutter Bypass East Borrow Canal Water Control Structures are integral parts of the ongoing Butte Creek restoration activities. Weir No. 2 and Willow Slough Weir remain the last major barriers to fish passage in the Sutter Bypass. The objective of this project is to replace the two existing weirs and their associated fish ladders on the EBC with new structures that will improve weir operational safety and efficiency and improve anadromous fish passage at each site throughout a greater range of flows.

II. Project Description

The California Department of Water Resources (DWR) has designed new water control structures to replace the existing water control structures, Weir No. 2 and Willow Slough Weir, which are deteriorating, dangerous to operate, and impede fish passage.

Weir No. 2

DWR proposes to replace the existing manually operated Weir No. 2 flashboard structure with a remotely operated gate structure that is safer and more effective to operate. In addition, DWR proposes to replace the fish ladder at Weir No. 2 with a new Full Ice Harbor fish ladder to improve passage for migrating Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*Oncorhynchus mykiss*).

The proposed project involves several components, which will take place in two phases over two years (2009 and 2010). The existing Weir No. 2 structure will be demolished and removed. The new remotely operated flow control structure will be built at the same location as the existing weir structure. The new fish ladder will be built on the east bank, opposite the existing fish ladder on the west bank; the existing fish ladder, which will remain operational until the replacement is fully installed, will subsequently be removed. A small control building for the operation of the automated gates will be constructed at the top of the east side levee of the EBC, which will be widened and electric lines will be installed to provide power to the control building.

Phase 1 of the project will occur from ~~mid-May~~ **May 1**, 2009 to mid-October 2009. Phase 2 of the project will occur from ~~mid-May~~ **May 1, 2010**. ~~2009~~ to mid-October 2010. The construction windows are devised to avoid impacts to sensitive species.

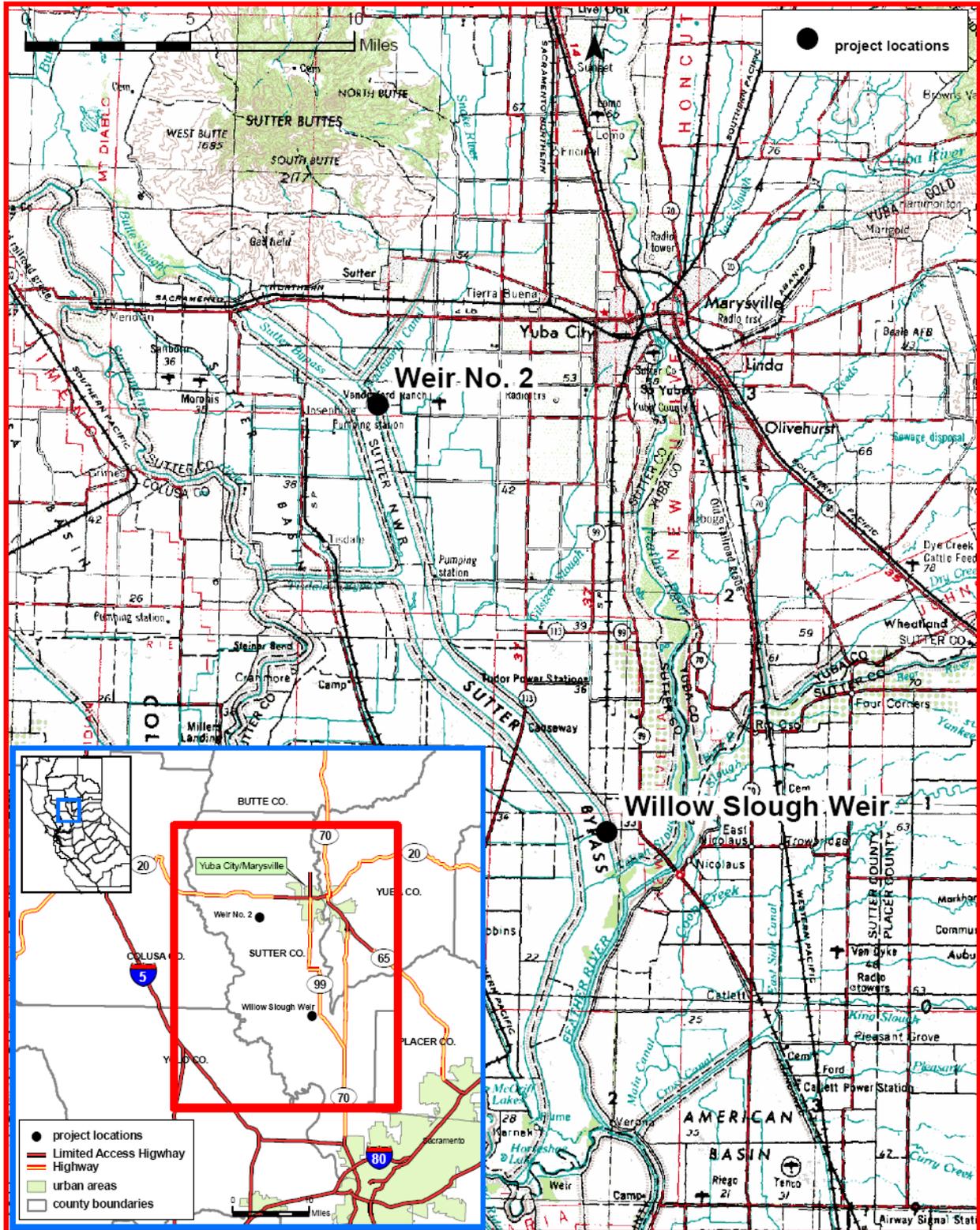
Willow Slough Weir

DWR proposes to remove the existing fish ladder and culverts in the earthen Willow Slough Weir and replace them with new structures which are designed to provide better flow control

from the EBC into Willow Slough, and improve passage between the two waterways for migrating Chinook salmon and steelhead.

The proposed project involves several components, which will take place between May 1, 2009 and ~~October 15, 2009~~ **October 1, 2009**. The new ladder and culverts will be built at the same location as the existing ladder and culverts. Water flow from the EBC into Willow Slough will be maintained at a minimum of 40 cfs throughout the project through the existing concrete culvert **when it is available from the EBC**. A temporary Denil fish ladder will be installed at the site to provide fish passage during construction activities while the existing fish ladder is not operational. A temporary bridge will be installed across Willow Slough to provide vehicle access, **prior to disabling existing access route across the weir**. The existing Willow Slough Weir will be excavated to remove the two corrugated metal pipe (CMP) culverts and the existing Denil fish ladder. Four new CMP culverts and a new Pool and Chute fish ladder will then be installed at the same location as the existing structures. Once the Pool and Chute ladder is fully operational, the temporary fish ladder will be removed. The existing concrete culvert will either be completely removed or will be capped. Impacts to riparian vegetation will be mitigated on-site following completion of construction activities.

Figure 1. Map of Project Locations within Sutter Bypass



Project Components

Weir No. 2

The Weir No. 2 replacement plan has two components:

- 1) replacement of the existing Weir No. 2 flashboard structure with a new remotely operated flow control structure, and
- 2) replacement of the existing fish ladder with a new Full Ice-Harbor fish ladder.

The new flow control structure will be built at the same location as the existing weir structure. The new fish ladder will be built on the east bank, opposite the existing fish ladder on the west bank, which will subsequently be removed. A small control building for the operation of the automated gates will be constructed at the top of the east side levee of the EBC, which will be widened.

The Weir No. 2 project area (Figure 2) is 4.07 acres in total, of which 2.56 acres will be used as staging areas, 1.15 acres are construction area, 0.09 acre is existing roads, and 0.04 acre is a road improvement. The construction area includes 0.14 acres of backfill on the landside levee face to create a site for a control building and approximately 0.5 acres upstream and downstream to include any anticipated sediment removal.

Construction will take place in two phases over two years, affecting half of the existing weir in each phase. During each phase there will be an active fish ladder in operation, allowing anadromous fish passage at all times. In each season construction will take place only between May 1 and ~~October 15~~ **October 1** to avoid impacts to special-status terrestrial species, particularly Giant Garter Snake.

The first phase of the project will take place between May 1, 2009 and ~~October 15~~ **October 1**, 2009. Access to this phase of the project will be through existing roads to the east Sutter Bypass levee, and then along the Sutter Bypass levee crown road to the project site (Figure 3).

It will consist of:

- 1) Preparation of staging areas and construction site. On or after May 1, 2009 the staging areas between the toe of the east side Sutter Bypass levee, which are in previously-disturbed areas, will be mowed to control herbaceous vegetation and to provide better visibility of any sensitive animal species in the area.
- 2) Construction of cofferdams, site dewatering, site preparation. On or after May 1, 2009, metal sheet-piling cofferdams will be installed with vibratory drivers in the eastern half of the EBC channel upstream and downstream of the weir to isolate the eastern half of the weir, and the site will be dewatered to permit construction of the weir. The existing fish ladder ~~on~~ **and** the western half of the weir will remain operational throughout this phase.
- 3) Removal and replacement of the east half of the existing weir. The de-watered east half of the weir, including the concrete foundation, will be demolished and removed to an approved off-site disposal area. The material underlying the existing foundation will be excavated and a new foundation, built on imported fill material, will be constructed; much

of the excavated material will be used to construct the control building base (see #4 below), and the remainder will be disposed of off-site. Approximately 2000 cubic yards of new fill will be brought in by dump truck, in an estimated 200 trips over 4-5 days. The eastern half of the weir and fish ladder will be constructed. The sheet pile cofferdams will be left in place until the second phase of the project.

- 4) Construction of the control building and associated levee improvements. A perpendicular extension of the existing Sutter Bypass east levee will be constructed on the land (east) side of the levee to provide a foundation for a building that will house controls for the automated weir gates and hydrologic monitoring equipment. The levee will have a base that extends out from the existing levee approx. 22 feet to the east, extends approximately 150 feet parallel to the levee (north-south), has a crown that is approximately 22 feet wide x 26 feet long, and a 2.5:1 side slopes. Approximately 2000 cubic yards of fill material taken from the weir foundation excavation site will be used to construct the levee extension. A concrete pad (22 ft. x 26 ft.) will be built on the crown of the extension for the foundation of the control building, and a prefabricated 12 feet by 16 feet sheet metal control building will be installed on the concrete pad.
- 5) Extension of electrical service to the control building. Electric lines will be installed from an existing electric pole approximately 0.6 mile north of the site to the weir control building (Figure 4). The line, which will be installed by Pacific Gas & Electric Co. personnel, will be supported by ten poles on the landside of the EBC levee, spaced at approximately 350-foot intervals, ten feet east of the levee toe. A line truck with a 24"-diameter drilling auger will be used to dig holes for pole placement, and will access the sites using the existing toe road. Each hole will be approximately 2' x 2' x 5'-6' deep (approx. 1.2 cubic yards per hole). Poles will be installed into augured holes, which will be backfilled with excavated soil; no concrete will be used for these sets but some of the holes may be backfilled with gravel for added wind movement and strength. Any excess spoil will be shoveled against the pole or leveled out around the pole area. Electric cables from the control building to the weir will be installed in a trench through the levee that will be excavated and then backfilled and compacted.
- 6) All equipment will be removed and the site will be cleaned up, and all disturbed areas will be restored to original contours, disked or ripped if needed to ameliorate soil compaction, seeded with native grasses and forbs, and covered by straw or tackifier to minimize erosion, on or before ~~October 15~~ **October 1**, 2009.

The second phase of the project will take place between May 1, 2010 and ~~October 15~~ **October 1**, 2010. It will consist of:

- 1) Maintenance and minor improvement of access routes. Access to the west side of the EBC will be through existing roads in the Sutter Bypass, both on private land and on the Sutter National Wildlife Refuge (SNWR) (Figure 3). ~~DWR has obtained a Special Use Permit from the USFWS to use the roads on the SNWR.~~ **(Note: DWR has confirmed that the project area will be accessed through an existing easement.)** These roads will be routinely maintained during this phase of the project and will be restored upon the project conclusion. One small improvement will be made to the intersection of the main north-

south access road and the short perpendicular road leading to Weir No. 2 (Figure 5). A small amount of fill (est. 50 cubic yards (yd³)) and 12-inch riprap (est. 20 yd³) will be placed in the ditch adjacent to the inner side of the turn to create a larger turning radius for equipment. These roads will otherwise be restored after all work is completed. Some small branches (<= 3" diameter) on Valley oak trees (*Quercus lobata*) that overhang the road may be trimmed to allow truck access.

- 2) Preparation of staging area and construction site. The staging area on the west side of the project, which is in a previously disturbed area, will be mowed to control herbaceous vegetation and to provide better visibility of any sensitive animal species in the area.
- 3) Removal of the eastern sheet-piling cofferdam and diversion of water through the new fish ladder. Flow will be directed through the new fish ladder to create a passage route for anadromous fish, followed by removal of sheet piling cofferdams with vibratory drivers from eastern half of project area.
- 4) Construction of cofferdams and site dewatering. On or after May 1, 2010, metal sheet-piling cofferdams will be installed with vibratory drivers in the western half of the EBC channel upstream and downstream of the weir to isolate the western half of the weir, and the site will be dewatered to permit construction of the weir. **The new fish ladder and the eastern half of the weir will remain operational throughout this phase.**
- 5) Removal and replacement of the western half of the existing weir. The remaining half of the weir structure will be demolished, and removed to an approved off-site disposal area. The western half of the weir will be constructed.
- 6) Removal of western sheet-piling cofferdam. After construction of weir is completed, the sheet-pilings will be removed with a vibratory driver.
- 7) Removal of equipment and restoration of staging areas. All equipment will be removed and the site will be cleaned up, and all disturbed areas will be restored to original contours, disked or ripped if needed to ameliorate soil compaction, seeded with native grasses and forbs, and covered by straw or tackifier to minimize erosion, on or before ~~October 15~~ **October 1**, 2010.

Figure 2. Weir No. 2 Project Area



Figure 3. Access Routes to Weir No. 2

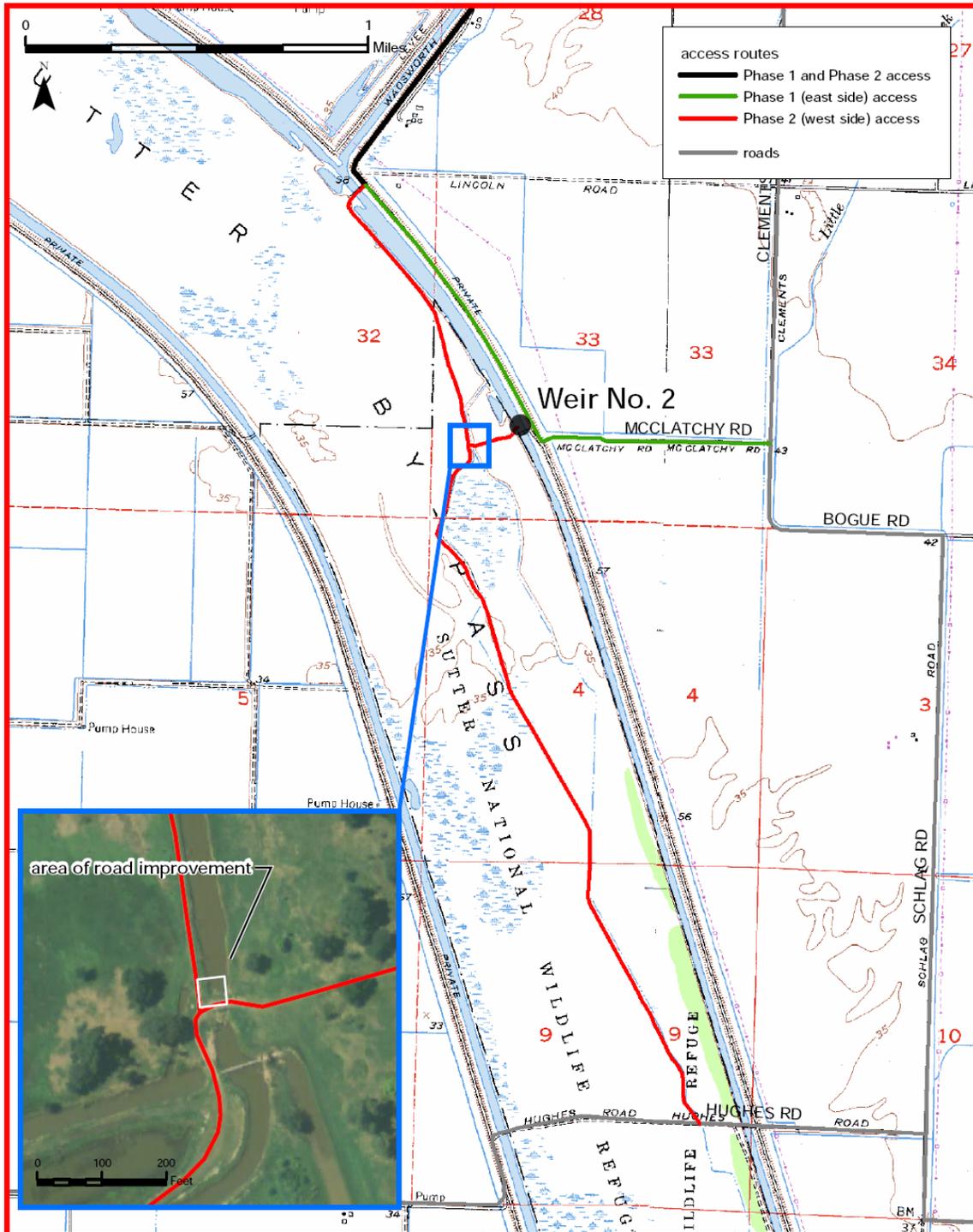


Figure 4. Proposed Locations of Utility Poles at Weir No. 2

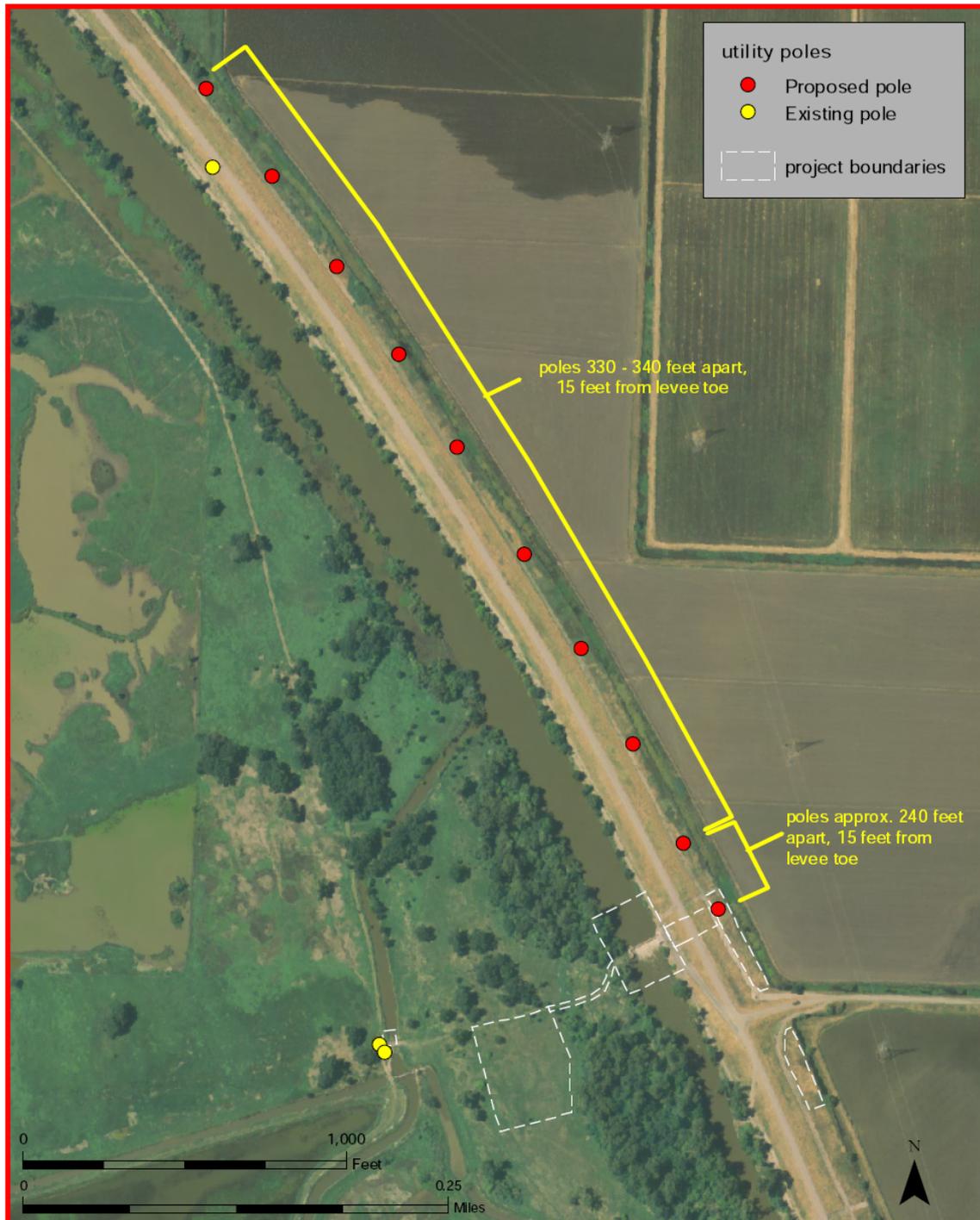


Figure 5. Improvement to Access Road at Weir No. 2



Willow Slough Weir

The Willow Slough Weir project area (Figure 6) is 3.84 acres in total, of which 1.75 acres are staging area, 1.99 acres are construction area, and 0.11 acres are temporary road crossing. Access to the project will be from Sacramento Ave. from the east, and/or Kirkville Rd. from the west (Figure 7).

The Willow Slough Weir replacement plan has four components:

- 1) replacement of two corrugated metal pipe (CMP) culverts with four new CMP culverts
- 2) removal of the existing Denil fish ladder and replacement with a new Pool-and Chute fish ladder
- 3) capping **or removal** of one existing concrete culvert
- 4) mitigation of impacts to riparian vegetation

The new ladder and culverts will be built at the same location as the existing ladder and culverts. Water flow from the EBC into Willow Slough will be maintained at a minimum of 40 cfs throughout the project (providing such flow is available from the EBC) through the existing concrete culvert.

Two temporary structures will be built to mitigate impacts of construction:

1. A temporary Denil fish ladder will be constructed to operate during the end of the migration period for spring run Chinook salmon (May 1 to July 1) and the beginning of the migration period for fall run Chinook salmon (mid to late Sept. to October). The temporary fish passage structure is necessary because the existing ladder will have to be disabled during construction of the new weir. A temporary Denil fish ladder (Figure 8) will be built at the site to provide anadromous fish passage during construction. The temporary ladder will lead to a resting pool formed by cofferdams. The resting pool will provide sufficient volume for upstream migrating fish to recover after passing the Denil ladder. The resting pool leads to the existing concrete culvert, which will meet NOAA Fisheries and Department of Fish and Game (DFG) criteria for passing adult anadromous salmonids. Design and hydraulic condition specifications of the fish passage structure are provided in Appendix C.
2. A temporary railcar vehicle bridge (Figure 9) will be installed approximately 500 feet downstream of the construction area with one support beam driven into the bed of the Willow Slough channel. The **temporary** bridge will be installed prior to excavation of the existing earthen weir. The crown road of Willow Slough Weir is the only access to agricultural land south of Willow Slough, and during construction that access will be interrupted. The **temporary** bridge provides access to those landowners for the duration of the project, and will be removed after the crown road on the new weir is completed. **(see Appendix N for additional details regarding design of the temporary bridge)**

Construction will take place between May 1, 2009 and ~~October 15~~ **October 1**, 2009. The construction process will consist of:

1. Preparation of staging areas. On or after May 1, 2009 the staging areas will be mowed, and minor road repair may be done as needed.
2. Installation of temporary vehicle bridge over Willow Slough. The rail car bridge(s) will be delivered to the site on flatbed trucks and installed on-site. (see Appendix N for additional details regarding design of the temporary bridge). Two steel piles will be installed at the center of the Willow Slough using vibratory drivers to provide structural support as needed. Abutments will be installed on each side to support the rail car bridge(s), either made of cast-in-place concrete, wood or prefabricated concrete. A small amount of excavation may be required at the banks to prepare and level the abutment sites. The rail car bridge(s) will be installed using a large crane (Figure 9).
 - a. Installation of temporary fish passage structure. A temporary fish passage route from a side channel in Willow Slough to the EBC will be created, consisting of the existing concrete culvert, a sheet pile cofferdam that creates a backwater pool at the culvert outlet, and a temporary fish ladder that provides lift from Willow Slough to the backwater pool. **The sheet pile cofferdam will be installed with vibratory drivers.** Details of the fish passage configuration are in Appendix C. The existing concrete culvert will be opened to provide fish passage and conveyance flows between Willow Slough and the EBC. **When sufficient water is available,** ~~at a minimum flow of 40 cfs of water, which will flow through the~~ temporary fish ladder from the EBC into Willow Slough.
3. Construction of cofferdams around weir and fish ladder and site dewatering. Sheet pile cofferdams will be installed with vibratory drivers upstream of the weir in the EBC channel, and downstream of the weir in the Willow Slough channel. The cofferdams will create an isolated area in the stream channel that can be dewatered for construction. The construction area will be dewatered for a minimum of 15 days, after which a US Fish and Wildlife Service (USFWS) approved biologist will inspect the area and certify that no Giant Garter Snakes (GGS) are present prior to the beginning of construction.
4. Removal of existing weir, CMP culverts and fish ladder. The existing earthen weir material will be excavated and removed to an approved off-site disposal area; if weir material is determined by project engineers to be suitable for re-constructing the new weir then material will be stored in designated staging areas. Existing CMP culverts and the old fish ladder structure will be demolished and removed from the site and disposed of at an approved off-site location.
5. Reconstruction of weir and installation of new culverts and new fish ladder. The new weir structure will be constructed of approximately 7,000 cubic yards of fill material. If existing weir material is inadequate, then new fill material will be brought in on trucks via Kirkville Road, in an estimated 700 trips over 23 days. The new fish ladder will be constructed on-site and four new CMP culverts will be installed in the weir, followed by completion of the earthen weir.
6. Diversion of flow through new culverts and fish ladder. Sheet pile cofferdams that were isolating the weir construction area will be removed from the Willow Slough and the

EBC using a vibratory driver, and water from the EBC will be diverted through the new ladder and culverts.

7. Removal of temporary fish ladder. The temporary fish ladder will be dismantled and removed from the site. Sheet-pile cofferdams that were used to create the backwater pool for the temporary fish ladder will be left in place for the next phase.
- ~~8. Construction of cofferdams around unused concrete culvert, for culvert removal or plugging. Sheet pile cofferdams will be installed with vibratory drivers upstream of the culvert in the EBC channel to create a dewatered area for removal or plugging of the culvert, followed by dewatering of the upstream construction area.~~
9. Capping and filling of existing unused concrete culvert. The existing concrete culvert will be either capped and filled with Tremi concrete (a type of concrete that will harden underwater, Appendix D) and permanently buried in the Willow Slough Weir earthen structure; or will be completely removed from the weir and disposed of.
 - a. For the capping option, both ends of the culvert, which are exposed in the dewatered area, will be plugged and tightly sealed. At the middle of the weir crown road, above the buried culvert, an access hole ca. 5' x 5' x 5-10 feet deep will be excavated with a 5-10 feet deep steel pipe for access to the concrete pipe. A hole will be drilled into the concrete culvert to provide entrance for a flexible pipe, which will be used to pump Tremi concrete into the culvert interior. The hole will then be plugged and the access pit will be backfilled and then graded as needed.
 - b. In the removal option, sheet pile cofferdams will be installed with vibratory drivers upstream of the culvert in the EBC channel to create a dewatered area for removal of the culvert, followed by dewatering of the upstream construction area. Weir fill material overlying the embedded culvert will be excavated by backhoe, the concrete culvert will be completely removed, and the excavated trench will be backfilled and compacted. The dewatered areas will be opened to flow and upstream and downstream cofferdams will be removed with a vibratory driver.
- ~~10) Removal of cofferdams. The dewatered areas will be opened to flow and upstream and downstream cofferdams will be removed with a vibratory driver.~~
- 11) Removal of temporary road bridge. After the earthen weir is complete, and the crown road is open, the railcar bridge and associated supports (piles and abutments) will be taken out and removed from project site.
- 12) Mitigation. Riparian plant material will be planted at the toe of the weir to replace mature vegetation removed during construction (see Appendix L - Mitigation, Monitoring, and Reporting Plan)
- 13) Removal of equipment and restoration of staging areas. All equipment will be removed and the site will be cleaned up, and all disturbed areas will be restored to original contours, disked or ripped if needed to ameliorate soil compaction, seeded with native grasses and forbs, and covered by straw or tackifier to minimize erosion, on or before ~~October 15~~ October 1, 2009.

Figure 6. Willow Slough Weir Project Area

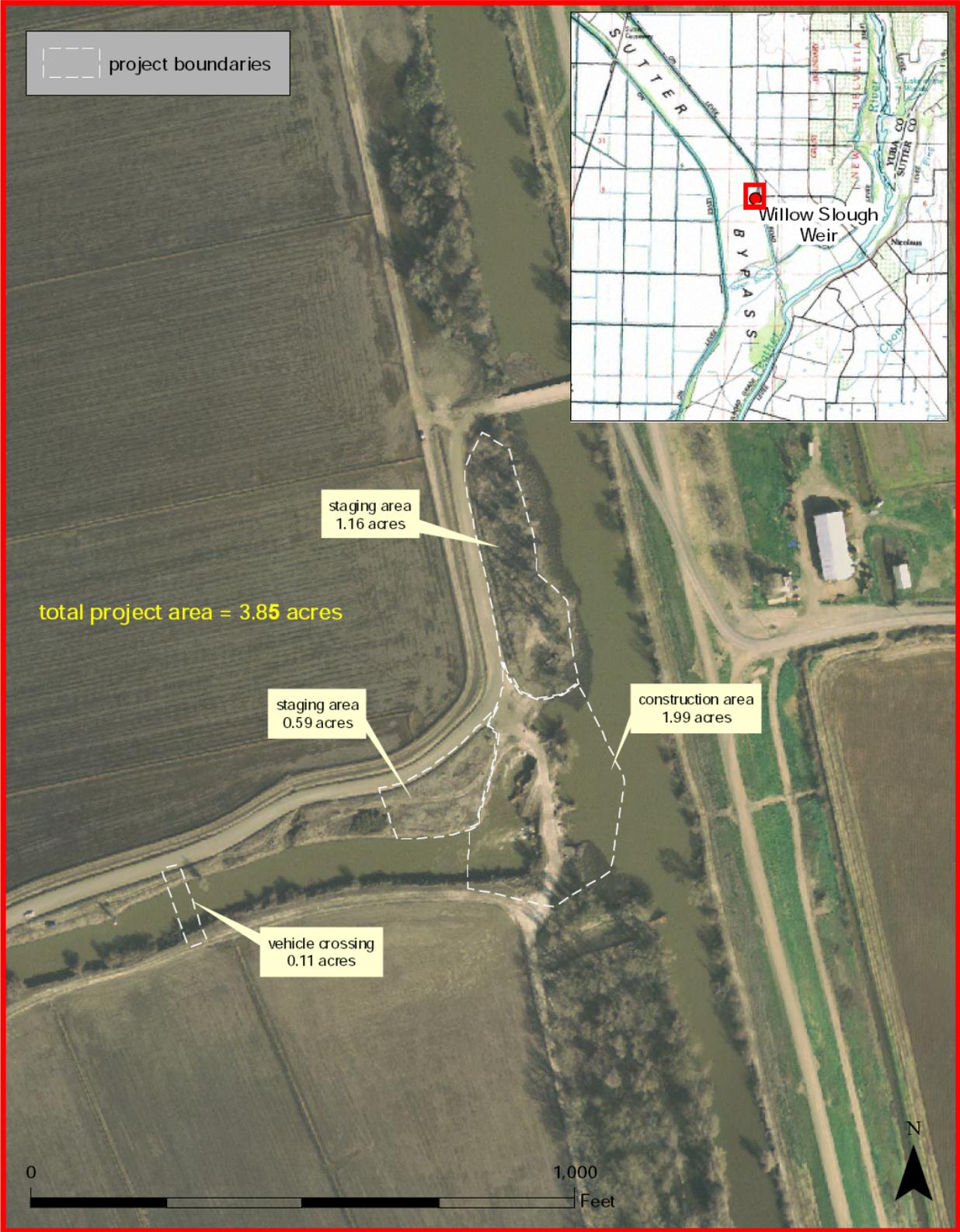


Figure 7. Access Route to Willow Slough Weir

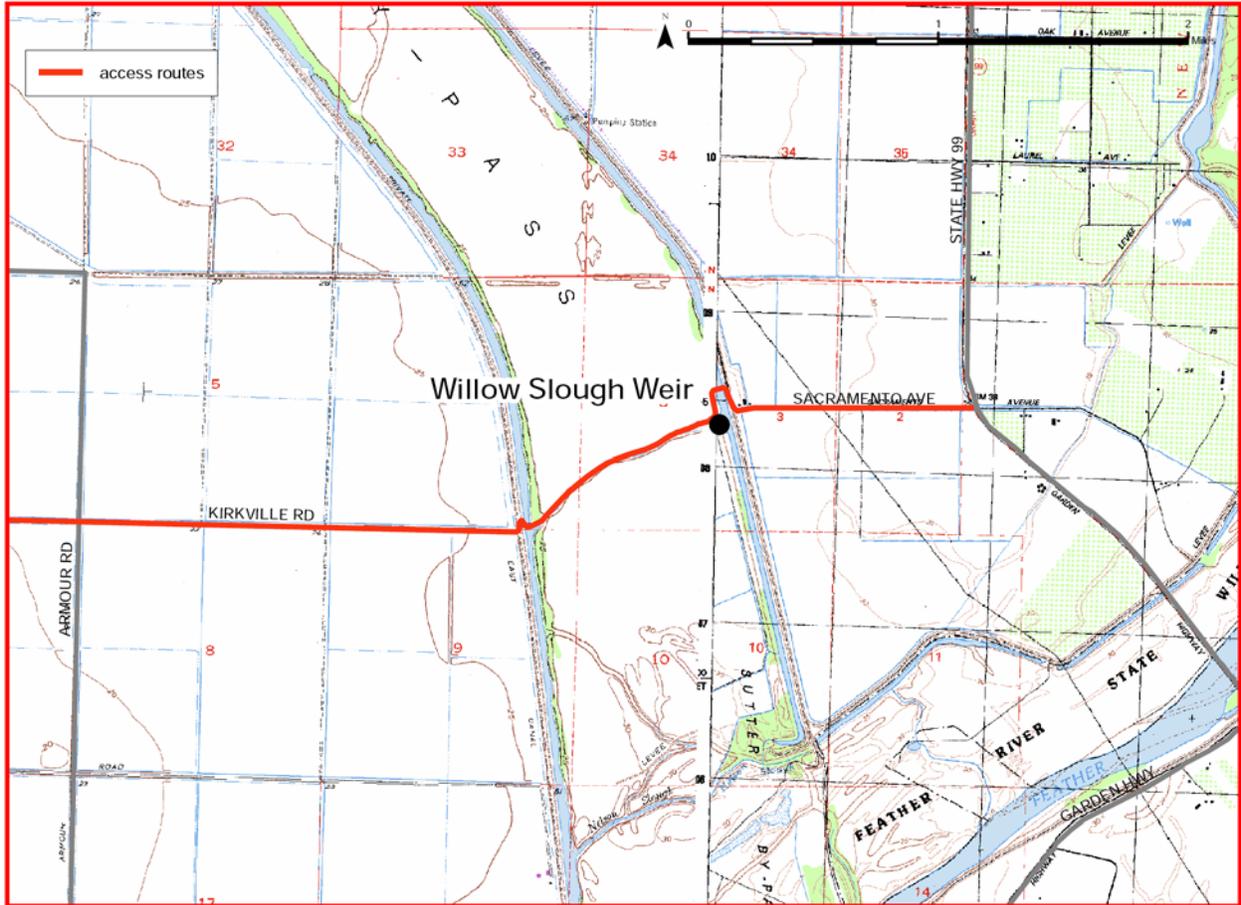
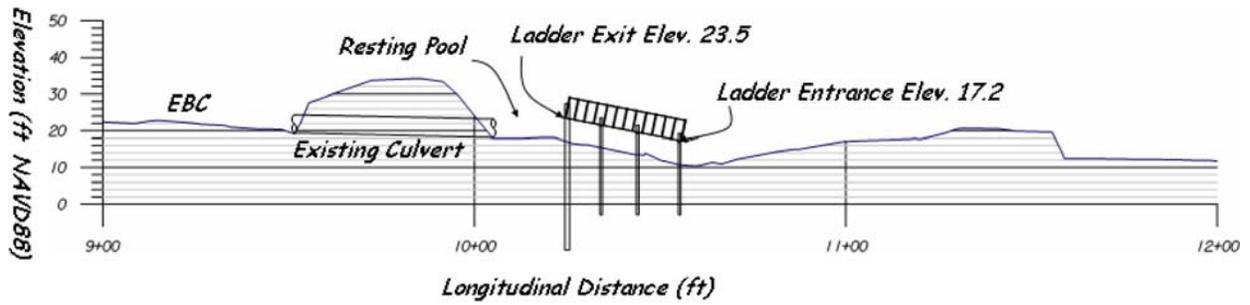


Figure 8. Temporary Fish Passage at Willow Slough Weir



Note: Downstream WSL influenced by West Barrow Canal and Willow Slough



Figure 9. Proposed Temporary Railcar Bridge at Willow Slough

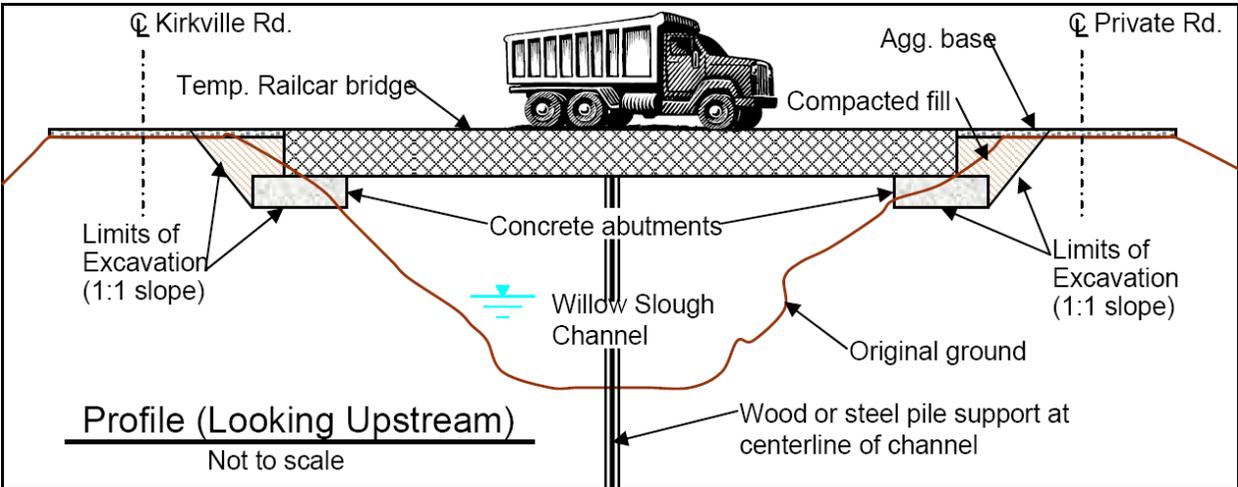


Figure 10. Existing Riparian Vegetation on Downstream side of Willow Slough Weir

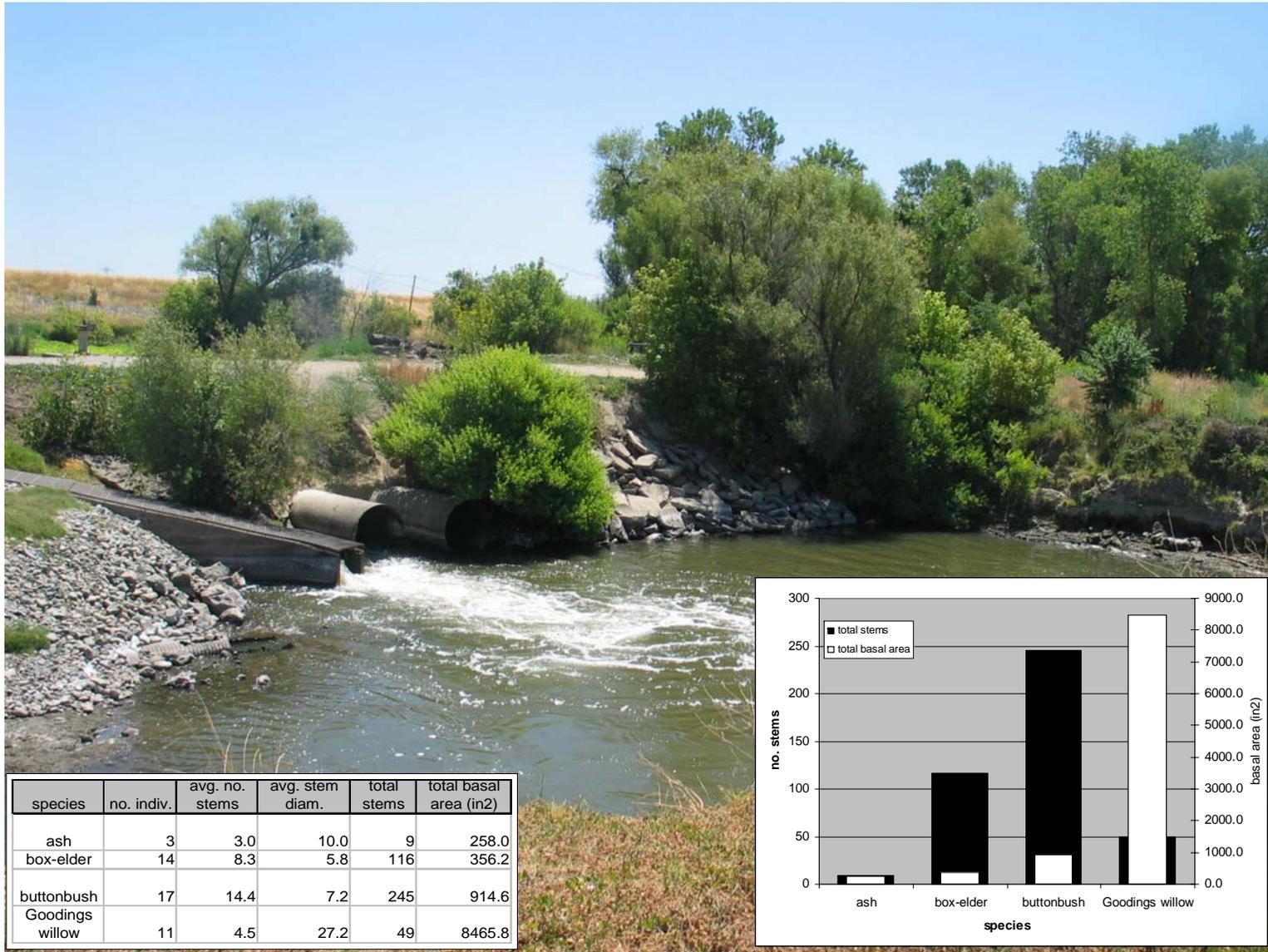
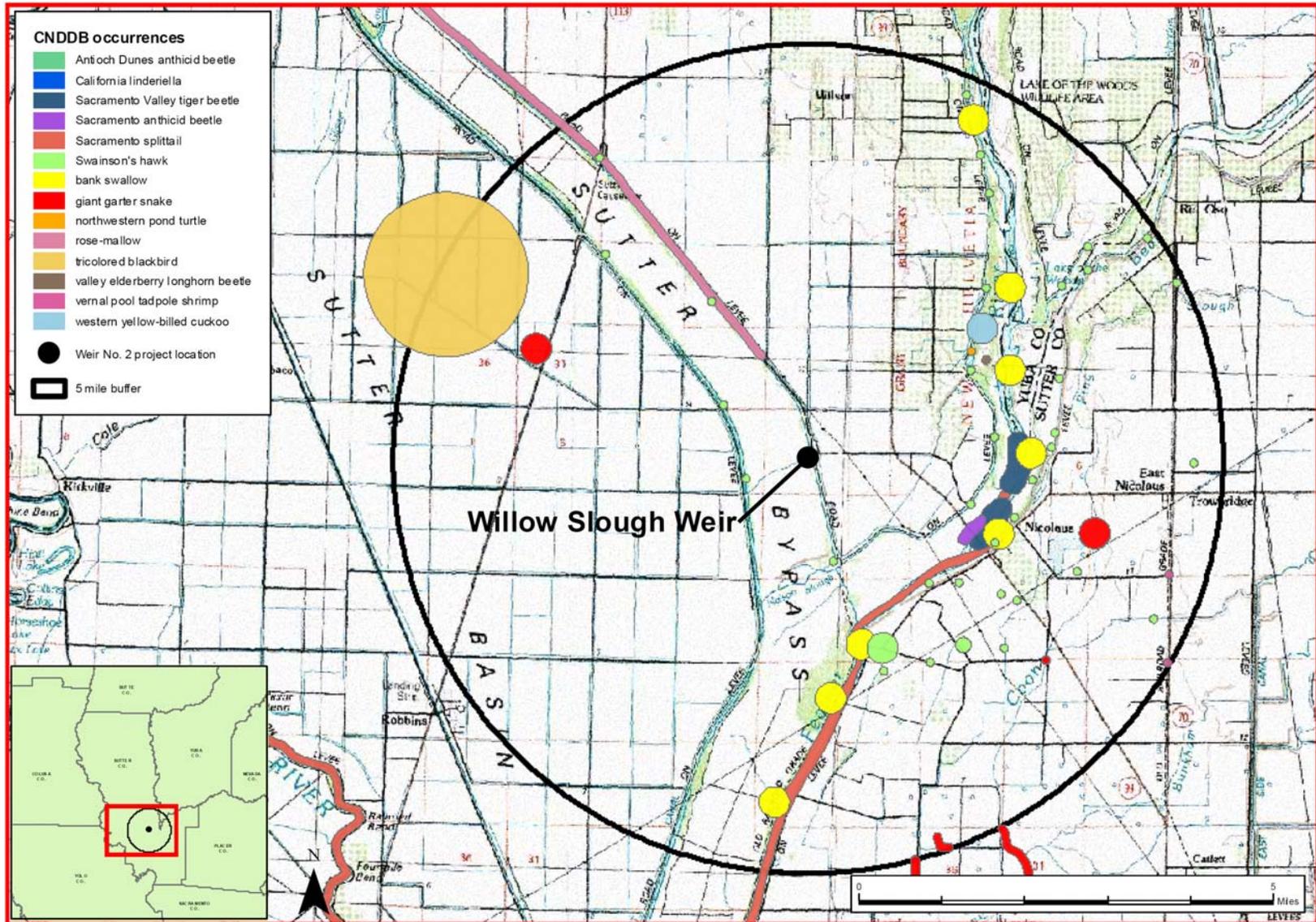


Figure 12. Occurrences of Special-Status Species (CNDDDB) in the Willow Slough Weir Project Area.



Required Permits, Approvals and Decisions

Federal Clean Water Act Section 404

Section 404 of the Clean Water Act establishes a permit program administered by U.S. Army Corps of Engineers (ACOE). The Act regulates the discharge of fill material into waters of the United States, including wetlands. ACOE also administers a Nationwide Permit Program to streamline permitting for certain types of activities that have only minimal impacts to the aquatic environment. Projects must comply with the terms of General and Regional Conditions to be authorized under Nationwide Permits (NWP). A Pre-Construction Notification has been submitted to ACOE for authorization of the project under NWP 33: Minor Discharges and NWP 3: Maintenance.

Federal Clean Water Act Section 401

Applicants for a federal permit allowing activities that may result in a discharge to navigable waters or their tributaries must obtain State certification that the discharge complies with other provisions of the Clean Water Act, and will not violate State and federal water quality standards. The Regional Water Quality Control Boards administer the certification program in California. An application for 401 Certification of the project will be submitted to the California Regional Water Quality Control Board, Central Valley Region, once California Environmental Quality Act (CEQA) compliance is completed. DWR **The contractor for the project** will file our intention to obtain a general NPDES permit for the construction activities and the contractor will **prepare** ~~propose~~ a Stormwater Pollution Prevention Plan.

Federal Endangered Species Act

Under the federal Endangered Species act, the U.S. Fish and Wildlife Service (USFWS) and/or the NOAA's National Marine Fisheries Service (NOAA Fisheries) regulate the incidental take of federally listed threatened and endangered species. Impacts to such species can be authorized if the take is incidental to otherwise lawful activities and would not jeopardize the continued existence of the species.

If a proposed activity might affect a federally-listed species and requires federal agency authorization (e.g., Clean Water Act, Section 404 permit) or has federal sponsorship, the permitting or sponsoring federal agency must initiate formal consultation with the USFWS and/or NOAA Fisheries (as appropriate for the species potentially effected) to determine whether the action (e.g., 404 permit issuance) would jeopardize the continued existence of the species.

This dialogue between the two federal agencies is known as Section 7 Consultation, referring to Section 7 of the Federal Endangered Species Act. USFWS or NOAA Fisheries is required to issue a jeopardy, or non-jeopardy, Biological Opinion and an incidental take statement, if appropriate, within 135 days. However, unlike other permit decision clocks, the applicant is not authorized to proceed if USFWS or NOAA Fisheries fails to meet this deadline. If it is determined that the federal action (e.g., Section 404 authorization) would jeopardize a species, no incidental take statement would be issued. If an incidental take statement is issued in a

Biological Opinion, ACOE (or other consulting agency) must adopt any required mitigation measures as conditions of the approval.

National Historic Preservation Act, Section 106

Section 106 of the National Historic Preservation Act requires that each federally sponsored project consider how that undertaking could affect historic properties. To ensure historic properties are protected, three steps may be required.

First, there should be a review of all the available information that could help determine whether there may be historic properties in the Area of Potential Effect (APE). Based upon the review, it is determined whether additional survey work is needed to locate historic properties. In this step, the ACOE would determine whether the potential for impact to historic properties has been adequately addressed. If potential impacts are identified, then ACOE and the State Historic Preservation Office (SHPO) together would apply the National Register criteria to determine whether identified properties are eligible for listing, and thus subject to the Section 106 process. Second, the potential project effects upon eligible (or listed) properties should be assessed. Third, if potential project effects are identified, consultation with SHPO and the Advisory Council should be undertaken to identify appropriate mitigation strategies.

California Environmental Quality Act (Public Resources Code 21000 et seq.)

CEQA applies to actions directly undertaken, financed, or permitted by State lead agencies, and establishes State policy to prevent significant and avoidable damage to the environment. It requires any public agency to disclose the environmental impacts of its projects to the public through appropriate environmental documentation. DWR has prepared this proposed Mitigated Negative Declaration and Initial Study, in compliance with CEQA.

California Fish and Game Code 1602

DFG code section 1602 requires State and local government agencies to notify the DFG before beginning construction projects which would divert, obstruct or change the natural flow or bed, channel or bank of any river, stream, or lake. Preliminary notification and project review generally occurs during the environmental process. When an existing fish or wildlife resource may be adversely affected, DFG is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Streambed Alteration Agreement. DWR will submit an application for a Streambed Alteration Agreement.

California Fish and Game Code 2050

The California Endangered Species Act (CESA) provides protection for threatened and endangered species under Sections 2050-2098 of the California Fish and Game Code. CESA prohibits “take” of a species, which is further defined as to kill, hunt, pursue, capture, or catch a species. Recently, this definition has been expanded to include habitat modification. DFG requires a Take permit that includes substantial biological documentation and requires full mitigation for the impacts to the species. Where a state-listed species is also federally listed, (as

is the giant garter snake, which could be affected by the proposed project) the required state-level incidental take authorization may be obtained via a “consistency determination” to be made by from DFG regarding the federal Biological Opinion.

Central Valley Flood Protection Board Encroachment Permit (Title 23)

The Central Valley Flood Protection Board must approve any project that proposes to work in a regulated stream, designated floodway on federal flood control project levee slopes or within 10 feet of the levee toe. Such activities might include but are not limited to: boat docks, ramps, bridges, sand and gravel mining, placement of fill, fences, landscaping and irrigation facilities. The purpose of these regulations is to carry out the board's duties pursuant to Water Code sections 8534, 8608 and 8710 - 8723. Under these statutes, the Board is required to enforce, within its jurisdiction, on behalf of the State of California, appropriate standards for the construction, maintenance, and protection of adopted flood control plans that will best protect the public from floods. DWR will apply for a Central Valley Flood Protection Encroachment Permit.

III. Environmental Setting

Location

The Sutter Bypass Weirs Replacement Project consists of two sites in Sutter County along the East Borrow Canal of the Sutter Bypass (Figure 1).

Weir No. 2 is approximately 27 miles upstream of the confluence of the Sacramento and Feather Rivers, just north of the intersection of the east side Sutter Bypass levee and McClatchy Road, Sutter County, CA; T15N R2E S33, Mount Diablo Meridian; UTM coordinates (NAD83, zone 10): northing 4328907.852, easting 607309.9909; and appears on the “Tisdale Weir” USGS 7.5 minute quadrangle. Access to the site is via Highway 99 to Bogue Road, to McClatchy Road to Weir No. 2.

The Willow Slough Weir project area is located immediately downstream of the Sacramento Avenue Bridge over the EBC, approximately 15 miles south of Yuba City; Sutter County, CA; T12N R3E S3, Mount Diablo Meridian; UTM coordinates (NAD83, zone 10): northing 4308262.1678, easting 619231.2612; and appears on the “Sutter Causeway” and “Nicolaus” USGS 7.5-minute quadrangles. Access to the site is via Sacramento Avenue from Highway 99, to the east side levee of the EBC in the Sutter Bypass, where the Sacramento Avenue Bridge crosses over the EBC to reach the Willow Slough Weir.

Climate

The project area is in a region of Mediterranean climate, characterized by hot, dry summers and mild, wet winters. The area receives on average between 20 and 25 inches of precipitation with most precipitation, in the form of rain, coming in winter and peaking in January. Summers in the

Sutter Bypass area are generally clear, hot, and dry, with an average July 24-hour temperature of 75°F in July, with high temperatures typically above 90 °F. Winters are generally mild and wet with highs averaging in the mid-40s to low-50s, and 45°F, respectively.

Geography

Sutter County is primarily comprised of gentle flatlands of the Sacramento River Valley, with its only prominent topographic feature being the Sutter Buttes, a volcanic plug at its northern boundary that rises abruptly 2,000 feet above the surrounding valley. The relatively flat alluvial plains generally drain to the southwest into the lower Sutter and American Basins, which are at elevations of 10 to 40 feet. The Sutter Bypass is a wide flood channel that carries excess Sacramento River floodwater parallel to the River down to the confluence of the Feather and Sacramento Rivers, and then on to the Yolo Bypass. It has generally level topography that is flooded in most years by flood flows that are diverted out of the Sacramento River via several designated overflow areas (i.e., constructed weirs at specific low points along the east side of the river) that allow high flood flows to exit from the Sacramento River channel.

Butte Creek (Butte Slough) enters the Sutter Bypass near Highway 20 and is split at the East-West Diversion Weir into the West Borrow Canal and East Borrow Canal (EBC), which were formed by construction of the Sutter Bypass levees and which lie immediately adjacent to the waterside toes of the western and eastern Sutter Bypass levees respectively. The EBC continues adjacent to the inside of the east levee of the Sutter Bypass to the point where it joins the Feather River immediately downstream of Lower Sacramento Road at Nelson Slough. The EBC is approximately 20 miles in length and supplies water to approximately 12,500 acres of farmland and managed wetlands through 3 large DWR pumps and 46 small private pumps.

The two project sites are located 14 miles apart on the EBC of the Sutter Bypass (Figure 1). The EBC is a borrow pit/channel created during levee construction that extends 20 miles along the east side of the Sutter Bypass from the East-West Diversion Weir to Nelson Slough. Flows in the EBC start from Butte Slough and are composed primarily of natural Butte Creek flows and irrigation return flows from the Butte Sink and the Butte Basin. Under controlled-flow conditions the East-West Diversion Weir, located at the head end of the Sutter Bypass, divides flow from Butte Slough into the East and West Borrow Canals. Additional water enters the EBC from the Wadsworth Canal, whose flows originate from agricultural drainage to the north and some of which was originally diverted from the Feather River. In late winter and spring the Bypass serves as a floodplain, alleviating flooding potential along the lower Sacramento River. During flooding, overbank flows move downstream from Butte Sink through the Butte Slough area and into the Sutter Bypass. When these uncontrolled flows reach the Sutter Bypass during flood events the flow in the East and West Side Channels is often united into a single water body.

Water surface elevation in the EBC is controlled during non-flood conditions by Weir No. 2 and the Willow Slough Weir, in conjunction with the Nelson Slough Weir, in the upper and lower reaches of the East Side Channel, respectively. The relatively constant surface elevation, which is maintained by adjusting these structures, facilitates pumping and diversion of irrigation water to lands along the Sutter Bypass.

Vegetation and Habitats

Vegetation in this area is predominantly characterized by agricultural and ruderal communities, with remnant stands of riparian forest.

Weir No. 2. The vegetation of the Weir No. 2 project site is dominated by weedy herbaceous species characteristic of dry disturbed ground, with scattered shrubs and small trees on the levee bank and one significant area of riparian forest on the west bank, outside the actual project boundary. The bed and banks of the EBC at Weir No. 2 are unvegetated alluvial sediment with some floating aquatic plant species along the water's edge. The surrounding landscape is agricultural outside the Sutter Bypass levees, most of it planted with rice; the surrounding area inside the Sutter Bypass are predominantly covered with moist ruderal plant species.

Willow Slough Weir. The vegetation of the Willow Slough Weir project site is dominated by weedy herbaceous species characteristic of dry disturbed ground, with some riparian vegetation on the weir face (Figure 10). The bed and bank of the EBC within the project area, which includes the upstream face of Willow Slough Weir, are unvegetated or are occupied by floating aquatic vegetation, with ruderal vegetation in areas above the waterline and up to the top of the bank. The only significant riparian vegetation in the project area is an area of mature riparian vegetation on the downstream (Willow Slough) face of the earthen weir, which provides shading for the area immediately near the fish ladder entrance. The rest of the downstream weir face is occupied by ruderal vegetation or is unvegetated.

Fish

A comprehensive list of fish species occurring in the Sutter Bypass can be found in Table 1. The Sutter Bypass plays an important role in the life history of five special status fish populations: Green Sturgeon, Central Valley Steelhead, Central Valley Spring-run Chinook Salmon, Sacramento River Winter-run Chinook salmon and Central Valley Fall / Late Fall-run Chinook Salmon.

Salmonids use the Sutter Bypass as a migration corridor to and from spawning grounds located higher up **upstream** in the Butte Creek System. Green Sturgeon do not spawn in Butte Creek but are present in the system because of the Sutter Bypass' hydrologic connection to the Sacramento River during high flows.

The Sutter Bypass offers excellent rearing habitat for special-status species when it is flooded. After floodwaters recede, water temperatures begin to increase, reducing the quality of habitat for special-status fish species.

An important feature of the Sutter Bypass is the multiple migration pathways through the Sutter Bypass that are available to special-status anadromous fish species. At the East-West Diversion approximately sixty percent of the flows from Butte Creek are diverted into the EBC and forty percent into the West Borrow Canal.

Table 1. Fish Species Occurring in the Sutter Bypass

Family	Common Name	Scientific Name
Acipenseridae	white sturgeon	<i>Acipenser transmontanus</i>
Atherinidae	inland silverside	<i>Menidia beryllina</i>
Catostomidae	Sacramento sucker	<i>Catostomus occidentalis</i>
Centrarchidae	black crappie	<i>Pomoxis nigromaculatus</i>
	bluegill	<i>Lepomis macrochirus</i>
	largemouth bass	<i>Micropterus salmoides</i>
	smallmouth bass	<i>Micropterus dolomieu</i>
	green sunfish	<i>Lepomis cyanellus</i>
	pumkinseed	<i>Lepomis gibbosus</i>
	redeer sunfish	<i>Lepomis microlophus</i>
	warmouth	<i>Lepomis gulosus</i>
	white crappie	<i>Pomoxis annularis</i>
Clupeidae	American shad	<i>Alosa sapidissima</i>
	threadfin shad	<i>Dorosoma petenense</i>
Cottidae	sculpin	<i>Cottus spp.</i>
Cyprinidae	Sacramento blackfish	<i>Orthodon microlepidotus</i>
	carp	<i>Cyprinus carpio</i>
	fathead minnow	<i>Pimephales promelas</i>
	goldfish	<i>Carassius auratus</i>
	golden shiner	<i>Notemigonus crysoleucas</i>
	hitch	<i>Lavinia exilicauda</i>
	red shiner	<i>Cyprinella lutrensis</i>
	Sacramento pikeminnow	<i>Ptychocheilus grandis</i>
splittail	<i>Pogonichthys macrolepidotus</i>	
Embiotocidae	tule perch	<i>Hysterothorax traski</i>
Ictaluridae	black bullhead	<i>Ameiurus melas</i>
	brown bullhead	<i>Ameiurus nebulosus</i>
	channel catfish	<i>Ictalurus punctatus</i>
	white catfish	<i>Ameiurus catus</i>
	yellow bullhead	<i>Ameiurus natalis</i>
Osmeridae	Wakasagi	<i>Hypomesus nipponensis</i>
Percichthyidae	striped bass	<i>Morone saxatilis</i>
Percidae	logperch	<i>Percina caprodes</i>
Petromyzontidae	Pacific lamprey	<i>Lampetra tridentata</i>
	river lamprey	<i>Lampetra ayresi</i>
Poeciliidae	Western mosquitofish	<i>Gambusia affinis</i>
Salmonidae	Chinook salmon	<i>Oncorhynchus tshawytscha</i>
	rainbow trout / steelhead	<i>Oncorhynchus mykiss</i>

(USFWS 2001)

Wildlife

A variety of wildlife species inhabit the Sutter Bypass, including: western pond turtle (*Clemmys marmorata*), western fence lizard (*Sceloporus occidentalis*), broad footed mole (*Scapanus latirnanus*), black-tailed jackrabbit (*Lepus californicus*), black-tail deer (*Odocoileus hemionus columbianus*), raccoon (*Procyon lotor*), coyote (*Canis latrans*), American white pelican (*Pelecanus erythrorhynchos*), double-crested cormorant (*Phalacrocorax auritus*), great egret (*Ardea alba*), mallard duck (*Anas platyrhynchos*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), mourning dove (*Zenaida macroura*), black phoebe (*Sayornis nigricans*), tree swallow (*Tachycineta bicolor*), cliff swallows (*Petrochelidon pyrrhonota*), American coot (*Fulica Americana*), bushtit (*Psaltriparus minimus*), western kingbird (*Tyrannus verticalis*), and red-winged blackbird (*Agelaius phoeniceus*).

An assessment of the presence of sensitive species that may inhabit the project area has been carried out and is discussed in Table 2.

Special Status Species

A list of special-status species (Table 2) was composed from official USFWS listing of listed species potentially occurring in Nicolaus, Sutter Causeway and Tisdale Weir USGS quadrangles; from occurrences listed by California Natural Diversity Database (CNDDDB) within 5 miles of the project area; and from surveys conducted by DWR biologists in the project area.

Table 2. Special-status species in the Sutter Bypass Weirs Replacement Project area

INVERTEBRATES					
Species	Common name	Status	Habitat	Potential Impacts	Reason for Determination
<i>Anthicus antiochensis</i>	Antioch Dunes anthicid beetle	--	Interior sand dunes	No impact	No habitat
<i>Anthicus sacramento</i>	Sacramento anthicid beetle	--	Interior sand dunes	No impact	No habitat
<i>Branchinecta conservatio</i>	Conservancy fairy shrimp	FE	Vernal pools and ephemeral stock ponds.	No impact	No habitat
<i>Desmocerus californicus dimorphus</i>	valley elderberry longhorn beetle	FT	Riparian and oak savanna with elderberry shrubs; elderberries are the host plant.	No impact	No elderberry shrubs present
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT	Vernal pools and ephemeral stock ponds.	No impact	No habitat
<i>Lepidurus packardi</i>	vernal pool tadpole shrimp	FE	Vernal pools and ephemeral stock ponds.	No impact	No habitat

FISH					
Species	Common name	Status	Habitat	Potential Impacts	Reason for Determination
<i>Acipenser medirostris</i>	green sturgeon	FT/CSC	Sacramento-San Joaquin estuary, coastal waters	Less Than Significant with Mitigation Incorporation	Anadromous fish passage will be maintained at all times around project sites via fish ladder.
<i>Onchorhynchus mykiss</i>	CV steelhead	FT/CH	Central Valley rivers; Delta, San Francisco Bay estuary	Less Than Significant with Mitigation Incorporation	Anadromous fish passage will be maintained at all times around project sites via fish ladder.
<i>Onchorhynchus tshawytscha</i>	CV spring-run Chinook salmon	FT/ST/CH	Central Valley rivers; Delta, San Francisco Bay estuary	Less Than Significant with Mitigation Incorporation	Anadromous fish passage will be maintained at all times around project sites via fish ladder.
<i>Onchorhynchus tshawytscha</i>	CV fall/late fall-run Chinook salmon	FC/CSC	Central Valley rivers; Delta, San Francisco Bay estuary	Less Than Significant with Mitigation Incorporation	Anadromous fish passage will be maintained at all times around project sites via fish ladder.
<i>Onchorhynchus tshawytscha</i>	Sacramento River winter-run Chinook salmon	FE/SE	Sacramento River; Delta, San Francisco Bay estuary	Less Than Significant with Mitigation Incorporation	Anadromous fish passage will be maintained at all times around project sites via fish ladder.
<i>Pogonichthys macrolepidotus</i>	Sacramento splittail	CSC	Slow moving river sections, dead end sloughs; endemic to Central Valley lakes and rivers but now confined to the Delta, Suisun Bay & assoc. marshes.	Less Than Significant with Mitigation Incorporation	Fish trapped within the construction area by the cofferdam will be rescued before dewatering occurs.

Table 2.(continued) Special-status species in the Sutter Bypass Weirs Replacement Project area

AMPHIBIANS					
Species	Common name	Status	Habitat	Potential Impacts	Reason for Determination
<i>Ambystoma californiense</i>	California tiger salamander, central population	FT	grasslands and low elevation foothill regions where ephemeral pools or ponds are available for breeding	No impact.	No habitat
<i>Rana aurora draytonii</i>	California red-legged frog	FT	Slow moving waters with dense vegetation; requires adjacent upland burrows for aestivation; negatively associated with presence of bullfrogs.	No impact.	No habitat

REPTILES					
Species	Common name	Status	Habitat	Potential Impacts	Reason for Determination
<i>Actinemys marmorata marmorata</i>	Northwestern pond turtle	CSC	Permanent or nearly permanent water in a wide variety of habitats. Requires basking sites; nest sites may be found up to 0.5 km from water.	Less Than Significant with Mitigation Incorporation	Project area will be dewatered during construction, and any turtles found on-site will be removed to a safe area nearby.
<i>Thamnophis gigas</i>	giant garter snake	FT/ST	Sloughs, canals, low gradient streams; freshwater marsh habitats; irrigation ditches and rice fields. Needs grassy banks/emergent vegetation for basking and high ground during winter flooding.	Less Than Significant with Mitigation Incorporation	Potential habitat exists within project area that cannot be avoided. Mitigation incorporated into the project will minimize impacts to a less-than-significant level.

Table 2.(continued) Special-status species in the Sutter Bypass Weirs Replacement Project area

BIRDS					
Species	Common name	Status	Habitat	Potential Impacts	Reason for Determination
<i>Accipiter cooperii</i>	Cooper's hawk	CSC	Nests are usually placed in second growth coniferous stands or in the deciduous riparian areas that are closest to streams.	Less Than Significant with Mitigation Incorporation	Potential habitat. Pre-project surveys will be conducted and protective measures will be implemented.
<i>Agelaius tricolor</i>	Tri-colored blackbird	CSC	Freshwater marsh; requires open water, protected nesting substrate, & foraging area with insect prey within a few km of the colony	Less Than Significant with Mitigation Incorporation	No colonies present. Potential habitat exists adjacent to project area, not within it, and any nests will be avoided. Pre-project surveys will be conducted and protective measures will be implemented.
<i>Buteo swainsonii</i>	Swainson's hawk	ST	Forests, savanna; requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations	Less Than Significant with Mitigation Incorporation	Potential habitat exists adjacent to project area, not within it. Pre-project surveys will be conducted and DWR will consult with DFG if nests are observed within a ¼ mile of the project area.
<i>Circus cyaneus</i>	Northern harrier	CSC	Marsh habitat, grasslands, fresh water wetlands, open wet meadows, areas along rivers and lakes, and crop fields. Ground nester.	Less Than Significant with Mitigation Incorporation	Potential habitat. Pre-project surveys will be conducted and protective measures will be implemented.
<i>Coccyzus americanus occidentalis</i>	Western yellow-billed cuckoo	FC/SE	Wide, dense riparian forests with understory of willows for nesting; sites with a dominant cottonwood overstory for foraging. Nests mid June-mid July.	Less Than Significant with Mitigation Incorporation	Potential habitat exists adjacent to project area, not within it. Pre-project surveys will be conducted and DWR will consult with DFG and USFWS if nests are observed within a ¼ mile of the project area.
<i>Elanus leucurus</i>	White tailed kite	CSC/FP	Lowland grasslands, agriculture, wetlands, oak-woodland and savannah habitats, and riparian areas associated with open areas.	Less Than Significant with Mitigation Incorporation	Potential habitat. Pre-project surveys will be conducted and protective measures will be implemented.
<i>Riparia riparia</i>	Bank swallow	ST	Riparian woodlands and riparian scrub; requires vertical banks/cliffs with fine textured or sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	No impact.	Potential habitat does not exist within the project area. Biological surveys have found no swallows in vicinity.

Table 2.(continued) Special-status species in the Sutter Bypass Weirs Replacement Project area

PLANTS					
Species	Common name	Status	Habitat	Potential Impacts	Reason for Determination
<i>Hibiscus lasiocarpus</i>	Rose-mallow	CNPS 2	Freshwater marshes, streambanks	Less than Significant Impact	Potential habitat exists adjacent to project area, not within it, and any plants found will be avoided.
<i>Trichocoronis wrightii</i> var. <i>wrightii</i>	Wright's trichocoronis	CNPS 2	Mud flats of drying riverbeds, vernal lakes, alkali meadows	No impact	No habitat.

Key:

- FE: Federally listed endangered
- FT: Federally listed threatened
- FPD: Federally proposed for delisting as endangered or threatened
- FC: Candidate to become listed species
- CH: Designated critical habitat
- SE: State listed endangered
- ST: State listed threatened
- CSC: California Species of Concern
- FP: California Fully-Protected Species
- CNPS2: California Native Plant Society List 2: Rare, threatened, or endangered plants in California, but more common elsewhere.

IV. Impacts and Mitigation Measures

Aesthetics

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

The scenic character of the project area is defined by the East Borrow Canal and Willow Slough and by the riparian vegetation along the levees of these waterways. The general public would view the area at Weir No. 2 looking from the east from McClatchy Road; the view from the west would be on USFWS Sutter National Wildlife Refuge property in a restricted area, so the public would not view Weir No. 2 from that direction. The Willow Slough Weir site provides a view of the EBC and Willow Slough looking downstream. The public may also view this project site looking east from Sacramento Avenue and west from Kirkville Road.

The project would not obstruct views of the EBC or Willow Slough. A small control building will be constructed at the Weir No. 2 site, but will not diminish the scenic quality of the visual resource or block views. The temporary vehicle bridge which will be constructed over Willow Slough will be removed upon completion of construction and therefore any visual impacts would be short-term.

Removal of riparian vegetation at both sites will be limited to the immediate construction areas and a small area of shaded riverine habitat (Figure 10) at Willow Slough Weir which will be replanted with woody riparian plant species following construction. Staging areas and the area of the east side levee, which will be widened, are characterized by mostly ruderal vegetation and weedy herbaceous species. Views to these areas will only be impacted temporarily because the areas will be revegetated with native grasses after construction has been completed.

The project ~~itself~~ is the replacement of existing structures with new structures of a similar size and function at the same location as the existing structures. Therefore, the views would not change substantially and impacts would be considered less than significant.

- a) Less than significant impact. The project sites are somewhat isolated and screened by trees and any impact would be temporary.
- b) Less than significant impact. Although the project will remove sediment, herbs, grasses, shrubs and some trees, seeding and natural recruitment will restore this vegetation. Disturbance or removal of vegetation will be mitigated as described above. No substantial damage will occur to scenery within a state scenic highway or near heavily trafficked areas. The area is isolated except for local agricultural related activities. No large rocks or buildings will be removed.
- c) Less than significant impact. The visual character is mostly defined by the waterways and corridors of trees along the levees. This project will not obstruct views of EBC or Willow Slough and will not remove trees with the exception of a small area at Willow Slough Weir as described above.
- d) No impact. The project will not create new sources of light.

Agricultural Resources

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
<p>a) No Impact. The project area does not overlap with Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Therefore, there will be no impact to Farmland from the project.</p> <p>b) No Impact. Project operations do not conflict with existing zoning for agricultural use or involve changes that could result in conversion of Farmland to non-agricultural use, therefore, there will be no impact.</p> <p>c) No Impact. Water diversions will be maintained throughout construction of the project. Implementation of the project would ensure a reliable water supply needed to maintain agricultural productivity in the area. Therefore, implementation of the project could be considered to have a beneficial impact upon agricultural resources. There will be no changes to the existing environment that could result in converting Farmland to non-agricultural use. The project does not include proposed changes in land use.</p>				

Air Quality

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>

California is divided geographically into 15 air basins to manage the air resources of the State regionally, and the project site is located within the Sacramento Valley air basin, and within the jurisdiction of Sutter County. The California Air Resources Board (ARB) has developed guidelines that help determine the significance of temporary and intermittent air quality effects resulting from construction activities. The ARB requires best available control technology requirements, and has a daily emission limit of 80 pounds per day of particulate matter smaller than 10 microns, an annual limit of 10 tons per year for any criteria pollutant, and record keeping and reporting requirements. Air quality impacts from the project would be considered significant if 80 pounds or more of PM₁₀ were to be generated daily from construction activities.

- a) No Impact. The Feather River Air Quality Management District (FRAQMD) sets Air Quality standards and rules for new development in Sutter County. Sutter County strives to submit development proposals to FRAQMD for review and comment in accordance with CEQA prior to consideration by the decision making body. This project will not conflict with or obstruct implementation of the air quality plan developed by FRAQMD.
- b) No Impact. The project will generate substantially less than 80 pounds per day of particulate matter and 10 tons per year of any ozone precursor. Construction activities

that generate 80 pounds per day or more of PM10 are large-scale developments with extensive grading. This project scale is too small to generate pollutants that would concern the ARB or adversely affect the local environment. Furthermore, all emissions will be minimized by using properly tuned equipment that meets current emission standards. Dust and other particulate matter generated by earthmoving, and truck traffic on exposed soil surfaces will be minimized by water trucks hydrating exposed surfaces.

- c) No Impact. Sutter County is classified as “non-attainment” for state “PM10” and “Ozone” standards. Because the project is a small-scale development, it will not result in considerable net increases to ozone or PM10. Furthermore, the project will not release emissions which exceed quantitative thresholds for ozone.
- d) No Impact. Sensitive receptors in the area include a residence about 900 feet to the east of the Willow Slough project area and the Sutter Wildlife Refuge located northwest of Weir. The residence is located outside the Sutter Bypass on the east side of the east levee. Therefore, with the use of mitigation measures listed above, the residence will not be exposed to significant concentrations of particulate matter. There are no hospitals, convalescent homes, schools, or churches nearby. Sensitive wildlife habitat will not be exposed to substantial pollutant concentrations with the use of the mitigation measures listed above.
- e) Less than significant impact. There will be an increase in diesel traffic during construction that will create diesel odors. Since the construction period is short and it is located in a rural area, any impacts created will be less than significant.

Biological Resources

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game, U.S. Fish and Wildlife Service or National Marine Fisheries Service?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game, U.S. Fish and Wildlife Service or National Marine Fisheries Service?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The project is designed to minimize and avoid impacts to biological resources (Appendix M). Most of the project footprint (including construction staging and access) is located on unvegetated or previously-disturbed areas. Additionally, temporal or spatial avoidance measures were incorporated into the project to minimize short and long-term impacts to biological resources including:

- Summer construction to minimize impacts to anadromous fish and to avoid the inactive season of giant garter snake.
- Minimization of the project footprint (spatial impacts)
- Minimum construction period (temporal impacts)
- Minimization of disturbance to riverine and riparian habitat
- Minimize direct habitat loss during project design and construction
- Retention of mature trees and avoidance of non-native landscaping
- Revegetation of areas of disturbed soil

a) Less than significant impact with mitigation. A list of sensitive species with the potential to occur in the area was compiled from USFWS and DFG resources (Table 2). Habitat requirements for each species were compared with habitat features in the project area to determine if the species has potential to be found in the area. If potential habitat is present or the species was actually found in surveys, potential impacts due to the project were assessed and mitigation measures proposed. The proposed project could potentially impact several of the species on this list. However, DWR anticipates that adverse impacts to

biological resources will be less than significant with mitigation and conservation measures incorporated into the project as described below.

General mitigation measures for impacts to sensitive species include:

- i. Construction personnel will receive worker environmental awareness training. This training will instruct workers to recognize sensitive species and their habitats.
- ii. Vegetation clearing will be confined to the minimal area necessary to facilitate construction activities. Sensitive species habitat that can be avoided by construction activities will be flagged.
- iii. If a sensitive species is encountered during construction, activities shall cease until appropriate corrective measures have been completed or it has been determined that the species will not be harmed.
- iv. Routine maintenance work (described in the project description) will include work windows, exclusion zones, and other protections designed to avoid impacts to sensitive species and habitats. These measures are specified in the existing DWR- DFG Memorandum of Understanding (Appendix G) about flood project maintenance. They ensure that routine maintenance work does not adversely affect fish and wildlife resources.

The following species have potential habitat in the project area. Potential impacts and proposed avoidance and mitigation measures are listed for each species that requires conservation measures.

Fish

Green Sturgeon: The green sturgeon is listed as Threatened by NOAA Fisheries and is listed as a Species of Special Concern by DFG. Green sturgeon occur in the Sacramento, Klamath, and Rogue rivers. Historically, spawning in the Sacramento River may have extended up into its three major branches: the Little Sacramento River, the Pit River System, and the McCloud River. Spawning may also have occurred in the Feather River. Loss of habitat in river reaches blocked by dams is the primary factor in this species' decline. Shasta and Keswick Dam on the Sacramento River and Oroville Dam on the Feather River block access to historical spawning and rearing areas, restricting spawning and rearing to the Sacramento River downstream of Keswick Dam. Other factors contributing to the species' decline include degradation of habitat conditions, entrainment in water diversions, and over-harvest.

Adult green sturgeon are thought to spawn every 3 to 5 years. Adults typically migrate into fresh water beginning in late February, with spawning occurring from March through July with peak activity from April through June (Moyle et al. 1995). The Sacramento River spawning population may travel over 200 miles and spawn in deep turbulent river mainstems. Specific spawning habitat preferences are unclear, but eggs likely are broadcast over large cobble where they settle into the cracks (Moyle et al. 1995).

Green sturgeon larvae grow quickly, and metamorphosis to the juvenile stage is complete in 45 days. Juveniles spend from 1 to 4 years in fresh and estuarine waters and disperse into salt water at lengths of 1 to 2.5 feet (Houston 1988). Downstream migration and rearing habitats for juvenile green sturgeon are reportedly not known at the present time (Deng et al. 2002). Information on green sturgeon in the Rogue River indicates that emigration occurs during fall and winter when water temperatures fell below

50°F (NOAA 2003). Juvenile green sturgeon are typically found in shallow water and probably move to deeper and more saline waters as they grow (Radke 1966, Environmental Protection Information Center et al. 2001). Sturgeon are bottom feeders and in streams feed on benthic insects, crustaceans, and annelids (Adams et al. 2002).

No Critical Habitat has been designated for green sturgeon. Although there are no spawning populations of green sturgeon in Butte Creek, their presence in lower Butte Creek is likely because of the connection to the Sacramento River during high flows. Measures to protect fish species from impacts related to the project are presented below in the section “Conservation Measures to Protect Fish Species.”

Central Valley Steelhead: The Central Valley steelhead is listed as Threatened by the NOAA Fisheries. The Central Valley Steelhead is not designated as special-status on a state list. The Central Valley steelhead historically inhabited large and small streams throughout the Sacramento-San Joaquin watershed. Currently populations are found in the Sacramento River and its tributaries and the Cosumnes and Mokelumne Rivers. In the San Joaquin River basin, they are limited to reaches below major dams on the Stanislaus, Tuolumne and Merced Rivers and to the mainstem San Joaquin River downstream of its confluence with the Merced River. Loss of habitat in river reaches blocked by dams is the primary factor in this species’ decline. Below dams, steelhead populations are affected by varying flow conditions, high summer and fall water temperature, and entrainment losses at unscreened diversions.

Steelhead use the project area as rearing habitat and as a migration corridor to and from spawning grounds in Butte Creek and other tributaries. They are present within the Butte Creek System year-round, either as juveniles rearing or migrating downstream or as adults migrating upstream or downstream. Although there are only limited observations, steelhead are thought to ascend Butte Creek in the late-fall and winter where they proceed to spawn in both the mainstem and tributaries (Brown, 1992) Spawning takes place through the winter and into spring (generally December through April). There is very little information regarding the numbers of steelhead in Butte Creek. Estimating production of steelhead in Butte Creek is complicated because of its hydrologic connections with the Sacramento River. Steelhead adults have been captured in Butte Creek during DFG trapping efforts for juvenile spring-run salmon, and the Sutter Bypass is known to be used as rearing habitat by juveniles (Hill and Webber, 1999). In the Sacramento River, juvenile steelhead migrate to the ocean in spring and early summer, with peak migration through the Delta in March and April (Reynolds et al. 1993).

The Critical Habitat for Central Valley steelhead is designated as: all river reaches accessible to listed steelhead in the Sacramento and San Joaquin Rivers and their tributaries in California; river reaches and estuarine areas of the Sacramento-San Joaquin Delta; all waters from Chipps Island westward to Carquinez Bridge, including Honker Bay, Grizzly Bay, Suisun Bay, and Carquinez Strait; all waters of San Pablo Bay (north of the San Francisco/Oakland Bay Bridge) from San Pablo Bay to the Golden Gate Bridge (Federal Register 1993).

Measures to protect Central Valley Steelhead from impacts related to the project are presented below in the section “Conservation Measures to Protect Fish Species.”

Central Valley Spring-run Chinook Salmon: The Central Valley spring-run Chinook salmon is listed as Threatened by the NOAA Fisheries and DFG. This run of Chinook salmon historically inhabited large and small streams throughout the Sacramento-San Joaquin watershed. Spring-run Chinook salmon have

been completely extirpated in the San Joaquin drainage. Currently spawning populations are consistently found only in Butte, Deer, and Mill Creeks, which are tributaries to the Sacramento River (DWR 2005). Recent restoration efforts have opened up habitat in Big Chico Creek, but currently this is considered a remnant non-sustaining population and is not used as a population trend indicator (McReynolds et al. 2005). Loss of habitat in river reaches blocked by dams is the primary factor in this species decline. Other factors contributing to the decline include degradation of habitat conditions, entrainment in water diversions, and over-harvest. Adult spring-run Chinook salmon migrate up the Sacramento River to upstream spawning areas from February through June. Adults seek deep holding pools to over-summer and spawn when water temperatures begin to cool in mid-September. Juveniles emerge from the gravel as early as late November. Trapping studies indicate that the majority migrate as fry or fingerlings, while a small portion of juveniles over-summer and emigrate as yearlings the next fall (McReynolds et al. 2005).

Spring-run Chinook salmon juveniles migrate downstream primarily from December through February, entering the Sacramento River either through the Butte Slough Outfall or through the Sutter Bypass. Life history investigations have shown that many juveniles entering the Sutter Bypass remain there for several weeks: the average passage time from January through April for fish that were marked just below the spawning grounds and recaptured in the Sutter Bypass near its confluence with the Sacramento River was 46 days during the 2003-2004 season (McReynolds et al. 2005), supporting the value of the Sutter Bypass as a nursery for spring-run Chinook salmon.

Critical Habitat for spring-run Chinook salmon is designated as: all river reaches accessible to listed Chinook salmon in the Sacramento River and its tributaries in California; river reaches and estuarine areas of the Sacramento-San Joaquin Delta; all waters from Chipps Island westward to Carquinez Bridge, including Honker Bay, Grizzly Bay, Suisun Bay, and Carquinez Strait; all waters of San Pablo Bay (north of the San Francisco/Oakland Bay Bridge) from San Pablo Bay to the Golden Gate Bridge (Federal Register 2000).

Measures to protect Central Valley spring-run Chinook salmon from impacts related to the project are presented below in the section “Conservation Measures to Protect Fish Species.”

Central Valley Fall / Late-Fall Run Chinook Salmon: The Central Valley fall/late fall-run Chinook salmon is a Candidate for listing by the NOAA Fisheries and has been designated a species of special concern by DFG. This run of Chinook salmon historically inhabited the entire Sacramento-San Joaquin watershed. Currently populations are found in the Sacramento River and its tributaries and the Cosumnes and Mokelumne Rivers. In the San Joaquin River basin, they are limited to reaches below major dams on the Stanislaus, Tuolumne and Merced Rivers and to the mainstem San Joaquin River downstream of its confluence with the Merced River. Loss of habitat in river reaches blocked by dams is the primary factor in this species decline. Below dams, populations are affected by varying flow conditions, alteration of stream flows, high summer and fall water temperature, over-harvest, and entrainment losses at unscreened diversions.

Chinook salmon require cold, freshwater streams with suitable gravel for reproduction. Adults spawn in fall when water temperatures decline to 60°F. After emerging, many Chinook salmon fry tend to seek shallow, nearshore habitat with slow water velocities and move to progressively deeper, faster water as they grow (Beauchamp et al. 1983). Many emerging fry are transported downstream into the lower rivers and the Delta, where they rear in shallow marshes and side channels.

Juveniles typically rear in fresh water for up to 5 months before migrating out to sea after reaching a length of 4-6 inches.

No Critical Habitat has been designated for fall/late fall-run Chinook salmon.

Measures to protect Central Valley fall/late fall-run Chinook salmon from impacts related to the project are presented below in the section “Conservation Measures to Protect Fish Species.”

Sacramento River Winter-run Chinook Salmon: The winter-run Chinook salmon is listed as Endangered by the NOAA Fisheries and DFG. This run of Chinook salmon historically spawned in the upper reaches of the Sacramento River and its major tributaries, the McCloud and Pit Rivers. Shasta and Keswick Dam block access to historical spawning and rearing areas, restricting spawning and rearing to the Sacramento River downstream of Keswick Dam. Impedance of migration and predation below the Red Bluff Diversion Dam, deterioration of water temperatures below Keswick Dam, and entrainment losses at unscreened diversions are the primary factors in this species’ decline.

Winter-run adults migrate through the Delta and into the Sacramento River in winter and early spring and spawn in the mainstem Sacramento River and Battle Creek during late spring and early summer (Moyle et al. 1995).

Juvenile salmon rear in the Sacramento River in summer and fall, gradually moving downstream before entering the Delta from November through March. Juveniles typically rear in fresh water for up to five months before migrating to sea when they reach a length of 4 to 6 inches. They migrate out of the Delta to the Bay from February through April.

Critical Habitat for winter-run Chinook salmon is designated as: the Sacramento River from Keswick Dam, Shasta county (River Mile 302) to Chipps Island (River Mile 0) at the westward margin of the Sacramento-San Joaquin Delta; all waters from Chipps Island westward to Carquinez Bridge, including Honker Bay, Grizzly Bay, Suisun Bay, and Carquinez Strait; all waters of San Pablo Bay (north of the San Francisco/Oakland Bay Bridge) from San Pablo Bay to the Golden Gate Bridge (Federal Register 1993).

Butte Creek does not contain spawning populations of Sacramento River Winter-run Chinook salmon. Sacramento River flows in excess of approximately 22,000 cubic feet per second (cfs) are diverted into the lower Butte Sink and Sutter Bypass via overflows from the Tisdale, Colusa, and Moulton weirs (Butte Creek Watershed Conservancy 1999). During these flows, the Sutter Bypass functions as a migratory corridor for juvenile winter-run Chinook salmon (USFWS 2000).

Measures to protect Sacramento River winter-run Chinook salmon from impacts related to the project are presented below in the section “Conservation Measures to Protect Fish Species.”

Sacramento Splittail: The Sacramento splittail is listed as a species of special concern by DFG. Splittail are found primarily in the Delta, Suisun Bay, Suisun Marsh, and Napa Marsh. During wet years, they may migrate as far upstream as Red Bluff Diversion Dam (Moyle 2002). Historically, they ranged throughout the Sacramento and San Joaquin Rivers and their tributaries. They have disappeared from much of these waterways because of dams, diversions or drastically altered habitat. Splittail exhibit a great ability to recover when they are presented with favorable conditions. However, based on their history and distribution, their long term survival as a species remains in doubt (Moyle 2002).

Adult splittail begin upstream migration during the winter and spring to feed and spawn in flooded areas. During wet years, splittail have the ability to move much further upstream which mimics their historic migration (Moyle 2002). Splittail production is greatest during wet years when floodplain habitat is inundated and high delta outflows occur. This correlation is likely because floodplains offer suitable spawning and rearing habitat for splittail (Moyle 2002). Splittail typically spawn in the spring months, although, spawning has been documented as early as January and as late as July (Wang 1986). During late winter and spring, young of the year juveniles are found in sloughs, rivers and Delta channels near spawning habitat. Juvenile splittail gradually move from shallow, nearshore habitats to the deeper, open water habitats of Suisun and San Pablo Bays (Wang 1986).

The Sutter Bypass offers good spawning habitat for splittail when it is flooded for several weeks in March and April. When these conditions occur, an abundance of juvenile splittail can be expected in the Sutter Bypass through the spring (Moyle 2002).

Measures to protect Sacramento splittail from impacts related to the project are presented below in the section “Conservation Measures to Protect Fish Species.”

Conservation Measures to Protect Fish Species

i) Fish Passage

Downstream migration of special-status salmonids coincides with construction during the months of May, June, September, and October. Upstream migration of special-status salmonids coincides with construction during the months of May, September, and October. However, impacts on migration will be minimized by providing fish passage throughout the construction season.

At Weir No. 2 the existing fish ladder will remain operable until the new fish ladder is completed. At Willow Slough weir, the existing fish ladder will have to be removed before construction on the new fish ladder begins. However, a temporary fish ladder will be constructed so that fish migration is not interrupted.

The temporary fish ladder at Willow Slough will provide upstream passage for adult salmonids migrating from Willow Slough into the EBC and downstream passage for juvenile salmonids migrating from the EBC into Willow Slough. For a detailed description of the temporary fish ladder configuration, see Appendix C.

During construction, anadromous fish migrating upstream will enter the side channel in Willow Slough and encounter the temporary Denil fish ladder, which was designed to meet NOAA Fisheries criteria and has been certified by NOAA Fisheries engineers (Appendix C). The ladder is designed to be 32’ long with a slope of 20% and should not hinder fish passage of upstream migrating salmonids; the temporary ladder should actually perform better than the existing ladder because flows will be limited to about ~~100 cfs~~ 123 cfs in Willow Slough during construction.

After passing through the fish ladder, upstream migrants will encounter a 25’ long resting pool. The volume of the pool will range from 6000 cubic feet to about 8500 cubic feet depending on the stage in the EBC. Upstream migrants will swim into the EBC from the resting pool through a 50’ long culvert, which will contain water flows with velocities that will not exceed 6 fps, except in rare circumstances (see Appendix C). Furthermore, the culvert will be fully submerged and have sufficient depth at all times for fish passage.

Downstream migrating anadromous fish will first enter the culvert and then encounter the 25' long resting pool. From the resting pool, fish can either go over the spillway or travel down through the Denil fish ladder. At lower flows, all of the flow will go through the fish ladder. At the highest flows, twice the amount of flow will go over the spillway compared to the flow going through the fish ladder (see Appendix C for details). Fish that go over the spillway will fall about 5' before landing in 5' deep water.

With the planned velocities and depth in the culvert, the conservative length and slope of the ladder, and large size of the resting pool, the temporary fish passage structure is expected to minimize impacts to migrating fish from construction activities.

ii) Fish Rescue and Relocation

Fish may be trapped in the isolated area behind the cofferdams. To minimize impacts to less than significant levels, DWR biologists will capture and relocate fish outside the cofferdams (Appendix J). Fish relocation will take place during cofferdam installation in May 2009 and May 2010. The fish rescue plan is adapted from Chapter Nine of the DFG *California Salmonid Stream Habitat Restoration Manual* and is consistent with measures defined as *reasonable and prudent* by NOAA Fisheries for projects concerning several northern California Evolutionary Significant Units for Coho salmon, Chinook salmon, and steelhead trout.

Species and lifestages of special-status fish that have the potential to be trapped in the isolated area behind the cofferdams include:

- Central Valley Spring-run Chinook salmon adult upstream migrants and juvenile downstream migrants
- Central Valley Fall/Late Fall-run Chinook salmon juvenile downstream migrants
- Central Valley Steelhead juvenile downstream migrants and rearing juveniles
- Green Sturgeon adults and juveniles introduced from Sacramento River overflow.
- Sacramento Splittail adults and juveniles

The areas that will be isolated include: a side channel in Willow Slough, an area surrounding the existing fish ladder and weir in Willow Slough, and an area surrounding the existing fish ladder and weir at Weir No. 2.

Fish relocation operations are expected to minimize project impacts to all special-status fish species by removing them from areas where they would have experienced high rates of injury or mortality. For details regarding the fish rescue plan refer to Appendix J.

iii) Instream Construction Activities ~~Water Conveyance~~

All instream construction work will be conducted in the dry behind sheet pile cofferdams. The cofferdams will be constructed around the weirs, prior to any soil-disturbing activities. Sutter Maintenance Yard staff will control the stage elevations upstream of Weir No. 2 and Willow Slough Weir during all phases of construction. Water velocity in the immediate vicinity of the weirs and cofferdams is expected to increase as water is routed around the cofferdams and through a smaller area; half of Weir No. 2 and one culvert in Willow Slough Weir. ~~Instream construction areas will be completely isolated from flow. However, the amount of water flowing downstream of the project site~~

~~will not change significantly. Aquatic communities downstream of project sites will not be subjected to a decrease in water flow from baseline conditions.~~ (Note: For additional details see Appendix N.)

iv) Storm Water Pollution Prevention Plan (SWPPP) and a Spill Prevention and Countermeasure Plan

Construction activities will disturb soils and could mobilize sediment into the main channel, producing temporary increases in turbidity and sedimentation downstream of the construction sites. Periods of localized, high suspended-sediment concentrations can cause clogging and abrasion of gill filaments in all fish, and reduce feeding opportunities for sight-feeding fish. Water quality and fish habitat could also be impacted by accidental spills or seepage of hazardous materials during construction. The implementation of a SWPPP and a Spill Prevention and Countermeasure Plan will greatly reduce the potential for these adverse effects to occur by implementing the best available preventative measures. Additionally, the May 1 - ~~October 15~~ **October 1** work window insures that such events would occur when listed fish species are less likely to be in the action area.

Reptiles

Giant garter snake: No giant garter snakes were observed during field investigations of the project area, but portions of the area provide potential habitat for the species, which includes marshes, sloughs, ponds, small lakes; and low-gradient waterways such as small streams, irrigation and drainage canals, and rice fields. The giant garter snake requires adequate water with herbaceous, emergent vegetation for protective cover and foraging habitat; and open areas and grassy banks for basking sites. Small mammal burrows and other small crevices at higher elevations provide winter hibernation sites and refuge from floodwaters.

Giant garter snakes are unlikely to be found within the Sutter Bypass because of the presence of predatory species, the lack of emergent cover, banks with little terrestrial vegetation for cover, dense riparian overstory providing few basking sites, and the disturbance from frequent seasonal flooding and routine maintenance activities within the Bypass and on the levees. Outside of the Sutter Bypass there is suitable giant garter snake habitat in some of the irrigation ditches, adjacent rice fields and on adjacent uplands.

At Weir No. 2 there is little suitable habitat for giant garter snakes within the Sutter Bypass levees due to a lack of herbaceous vegetation on banks or emergent aquatic vegetation, large amounts of riparian cover on banks, and lack of foraging habitat in the vicinity. The project area that lies outside the Sutter Bypass levees (control building and staging areas) is in an area of suitable giant garter snake habitat because it is adjacent to a permanently flooded irrigation ditch that has abundant herbaceous emergent vegetation, no riparian overstory, and is adjacent to cultivated rice fields.

The Willow Slough Weir project site is completely within the Sutter Bypass, which is not optimal giant garter snake habitat due to disturbance from frequent seasonal flooding and routine maintenance activities within the Bypass and on the levees. However, this site contains suitable habitat for giant garter snake because it is adjacent to the EBC, a waterway with emergent herbaceous vegetation and no riparian overstory, which makes it potential giant garter snake habitat, and is also adjacent to cultivated rice fields, which are potential giant garter snake foraging habitat.

Construction activities associated with the project, including equipment movement and staging, have the potential to kill, injure, or disturb giant garter snakes or impact their habitat. Routine maintenance activities on the levees could impact potential habitat by removing vegetation cover, basking sites, and/or burrows, which could result in disturbance, displacement, injury or mortality of snakes.

The following conservation measures are proposed to minimize adverse impacts to giant garter snakes.

- i. Construction activity within giant garter snake habitat (suitable aquatic habitat and adjacent uplands within 200 feet) will be conducted within the snake's active season (May 1 to October 1), when direct mortality is lessened because snakes are expected to actively move and avoid danger. If it appears that construction activity within giant garter snake habitat may go beyond October 1, additional measures may be necessary to minimize take.
- ii. 24-hours prior to construction activities, the project area will be surveyed for giant garter snakes.
- iii. Exclusion fencing will be erected adjacent to suitable aquatic habitat outside the Bypass during construction activities.
- iv. Dewatered areas in potential giant garter snake habitat will remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.
- v. Permanent loss of habitat will be compensated at a ratio of 3:1 by purchasing giant garter snake habitat credits at a US Fish and Wildlife Service-approved mitigation bank. Any disturbance to giant garter snake habitat (suitable aquatic habitat plus 200 feet immediately adjacent to it) occurring between October 2 and April 30 will be compensated at 6:1 regardless of whether the disturbance is temporary or permanent.

Western pond turtle: Western pond turtles have been observed in the East Borrow Canal, and the upland areas within the Bypass provide suitable nesting habitat; however, frequent flooding and disturbance from routine maintenance activities may substantially reduce nest success if hatchlings over-winter in the nest. The mostly grass-covered bypass levees may provide more successful nesting habitat, especially the south-facing slopes. This species may also inhabit the larger irrigation ditches near the spoil areas.

Western pond turtles may be directly and indirectly adversely affected by the proposed project. In order to avoid or minimize adverse impacts to western pond turtles, the following measures will be implemented.

- i. In-water work will be avoided to the extent practicable. In cases where this is unavoidable, a biological monitor will survey the sites before work commences. If turtles are found, efforts will be made to move them to suitable habitat outside the disturbance area. Excavation will be done in a manner that minimizes impacts to water quality and aquatic habitat. Shallow ponded areas will not be impacted until they have dried down and no longer provide habitat for turtles.
- ii. To reduce impacts to turtle nests, disturbance to uplands will be limited to the minimum amount necessary, and disturbed areas will be revegetated.

Birds

Swainson's hawk: Swainson's hawks are known to nest in the large trees along the inside levee toes and toe drains of the Tisdale Bypass and East Borrow Canal of the Sutter Bypass. No Swainson's hawks are currently known to nest in trees within the project area and the proposed project does not involve the removal of trees which could provide nesting habitat. At the Weir No. 2 site, the nearest known observations of Swainson's hawks, as reported in the California Natural Diversity Database (CNDDB 2006; data updated May 2008) (Figure 11), are two sightings (recorded 2003) between 2.5 to 3 miles

south of Weir No. 2 along the east side of the Sutter Bypass. Fledglings were observed in cottonwood nest trees surrounded by riparian vegetation. At the Willow Slough Weir site, the nearest observations of hawks are three sightings; adults with chicks were observed at two cottonwood nest trees located approximately 1 mile from the weir along the West Borrow Canal (recorded 2004), and a pair of adults were sighted near the confluence of Nelson Slough and the EBC (recorded 1984). Because Swainson's hawks could potentially nest near the project area, standard surveys and protections will be implemented to the greatest extent possible to protect nesting hawks. If nests are observed within ¼ mile of the project area, DWR will consult with DFG to implement protective measures. This species could potentially be impacted by construction activities, although the likelihood that a take will occur is minimal.

Western yellow billed cuckoo: The western yellow billed cuckoo is not known to nest on or adjacent to the project sites. The nearest known observations of western yellow-billed cuckoos, as reported in the CNDDDB (Figure 11), are three sightings that are each approximately 9 miles from Weir No. 2, in Riparian Forest adjacent to Butte Slough (1 occurrence, recorded 1976) and adjacent to the Feather River (2 occurrences, reported 1976 and 1986); and two sightings (1977 and 1987) approximately 2 miles from Willow Slough Weir, in Riparian Forest on the Feather River. The habitat at the Willow Slough Weir site does not appear to be suitable for this species. Habitat at the Weir No. 2 site appears slightly more suitable for cuckoos. However, it is unclear whether the immediate area contains habitat components necessary for the species to nest there. Cuckoos inhabit extensive deciduous riparian thickets or forests which abut on slow-moving watercourses, backwaters, or seeps. Willows are almost always a dominant component of the vegetation. Nests are typically in sites with at least some willow, dense understory foliage, high humidity, and wooded foraging spaces in excess of 300 feet in width and 25 acres in area. Although this species is not likely to be present during construction activities, measures will be taken to avoid impacts to nesting cuckoos. Pre-construction surveys will be conducted in the project area. If nests are found within ¼ mile of the project area, DWR will consult with USFWS and DFG to implement protective measures.

White tailed kite: Although no white-tailed kites have been observed nesting in the proposed project sites or immediately adjacent areas, this species could be present during construction activities. White-tailed kites nest in large shrubs and trees, often associated with riparian corridors. Surveys for nesting kites will be conducted prior to the initiation of construction and protections, which may include exclusion zones, will be used to avoid impacts.

Tricolored Blackbird: Tricolored blackbirds have not been observed at the project site during avian surveys, but occur throughout the Central Valley. The nearest known observation of this species, as reported in the CNDDDB (Figure 12), is one sighting (recorded 1932) located approximately 5 miles northeast of Willow Slough Weir. Sutter Maintenance Yard staff regularly conducts routine maintenance work on and near the staging areas, which would reduce the likelihood of birds nesting in these areas. Although tri-colored blackbirds are known to nest in woody thickets, they do not typically nest immediately adjacent to or under mature riparian trees but would be more likely to nest in the tules/cattails that are present near the project area. Nesting habitat is available immediately adjacent to both project sites- the habitat adjacent to the Weir No. 2 site appears to be more suitable than habitat adjacent to Willow Slough Weir. Surveys will be conducted for tri-colored blackbirds prior to the initiation of construction, and in the event they are nesting on the project-affected site, DWR will consult with DFG and protective measures will be implemented.

Raptors and Migratory Birds: Raptors may be present during construction activities at the project sites. Sutter Maintenance Yard staff regularly conducts routine maintenance work on and near the staging

areas, which would reduce the likelihood of birds nesting in these areas. During avian surveys, DWR staff observed Northern harriers and Cooper's hawks near the sites, but did not detect nests near or within the project area. Red-tailed hawks (*Buteo jamaicensis*) and Red-shouldered hawks (*Buteo lineatus*) were observed in the area, but no nests were observed in close proximity to either weir. The proposed construction activities have the potential to adversely affect nesting areas of raptors or migratory birds. Prior to initiating construction activities, surveys will be conducted for active nests near and within the construction sites and staging areas. If an active nest is located near or within these areas, DWR will consult with DFG to determine the course of action to avoid nest abandonment and will subsequently implement the appropriate measures to protect nesting raptors or migratory birds.

Plants

Rose mallow: Rose mallow grows along freshwater river banks and marshes. It has been found in the Sutter Bypass and potential habitat is present adjacent to both project sites, but no individuals have been found in any affected area during botanical surveys. Any individuals encountered during the project will be flagged and avoided.

Wright's trichocoronis: This plant grows on mudflats of vernal lakes and drying riverbeds. No potential habitat is present within the project area, and no Wright's trichocoronis were found during surveys conducted by DWR staff in the spring and summer of 2007.

Invertebrates

Sacramento anthicid beetle, Antioch Dunes anthicid beetle: These beetles occur on sand bars, sand dunes or other sandy soil along watercourses. No observations of these insects have been reported to the CNDDDB within the Sutter Bypass, and no suitable habitat is within the project area, therefore no impacts to these species are anticipated.

Conservancy fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, California linderiella: These aquatic invertebrates occur in vernal pools and ephemeral stock ponds, habitats that are not found in the project area, therefore no impacts to these species are anticipated.

Valley elderberry longhorn beetle: Elderberry shrubs, which are potential habitat for valley elderberry longhorn beetle, have not been observed during biological surveys in or near the project area, therefore no impacts to this species are anticipated. Any elderberry shrubs encountered within work areas will be fenced with a 100 foot buffer, flagged, and avoided during construction as described by the USFWS in "Conservation Guidelines for the Valley Elderberry Longhorn Beetle" (USFWS 1999).

- b) Less Than Significant with Mitigation Incorporation. A small area of riparian vegetation will be removed during removal and replacement of Willow Slough Weir (Figure 10). This vegetation will be restored after project completion to reestablish riparian and shaded riverine aquatic habitat (see Appendix L)
- c) Less Than Significant Impact. All impacts to wetlands will be temporary, caused by equipment staging.
- d) Less Than Significant with Mitigation Incorporation. A key objective of this project is to improve fish passage in the Sutter Bypass throughout a wider range of flows. There will be a long term beneficial impact to migratory fish. Short-term construction impacts will be minimized by providing fish passage

during construction. At Weir No. 2, the existing fish ladder will remain in operation until the new fish ladder is complete. At Willow Slough Weir, the existing fish ladder will need to be removed so that construction on the new fish ladder may begin. However, a temporary fish ladder will be installed to minimize impacts to fish migrating past Willow Slough Weir. This mitigation measure is discussed above in “Conservation Measures to Protect Fish Species” and is presented in detail in Appendix C. Because of these mitigation measures incorporated, impacts associated with the movement of migratory fish will be less than significant.

The proposed project involves the extension of electrical service to the control building located outside the east levee at Weir No. 2. The line will be supported by ten poles on the landside of the EBC levee, spaced at approximately 350-foot intervals, ten feet east of the levee toe. Power lines can adversely affect migratory birds, causing injury or death. Birds can also be electrocuted from transformers and other pole hardware. Pacific Gas and Electric Co. (PG&E) will be responsible for installation of the power line and power poles. PG&E has developed the Avian Protection Plan (APP) to better protect migratory, threatened and endangered birds while improving safety and reliability for its customers. Part of the program, which has been in place since 2002, outfits all new poles and replacement poles in bird-sensitive locations with bird-safe equipment. Key components of the program focus on reducing the risk of power line collisions and electrocutions, including: employee training and compliance; making utility poles bird-safe; and public education and partnerships. PG&E will incorporate bird-safe equipment, pursuant to the APP, which will minimize the impacts to migratory birds.

The project footprint is located on highly altered habitat and is too small to interfere with the movement of non-avian wildlife or non-avian wildlife corridors.

- e) No impact. The project will not conflict with any local policies or ordinances.
- f) No impact. The project area overlaps with the proposed boundaries of the Yuba and Sutter County Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP) but will not conflict with the plan, which is currently in development (Sydney Vergis, pers. comm.) Sutter County has released a preliminary report titled the Report of Independent Science Advisors for the Yuba and Sutter County NCCP/HCP (Sutter County 2006). The project is consistent with recommendations identified in this report. The Yuba/Sutter NCCP/HCP is currently being designed to protect open space in the valley and lower foothill portion of both counties.

Cultural Resources

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in '15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to '15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

DWR has conducted a cultural resources study in compliance with Section 106 of the National Historic Preservation Act for the CWA 404 permit. DWR archaeological staff (Janis Offermann) inspected the site and requested a search of records maintained at the Northeast Information Center of the California Historic Resources Information System at California State University Chico and from the Native American Heritage Commission, and in addition Weir No. 2 was evaluated for architectural significance by an architectural historian (Dr. Tanya Komar, College of Engineering, California State University, Chico), who concluded that it held no special status.

- a) No impact. No significant historical resources have been identified in the project area.
- b) No impact. No archaeological resources were identified by pre-project surveys of the project area or archaeological record searches. If archaeological resources are found during the course of construction, all work will stop in the immediate vicinity of the finds until they can be evaluated by a qualified archaeologist and an appropriate plan of action can be determined in consultation with the State Office of Historic Preservation.
- c) No impact. No paleontological resources or unique geologic features are known to exist within the project area.
- d) No impact. No evidence of individual interments or a cemetery was identified during a site visit. Should human remains be unearthed during the course of construction, all work will immediately stop in the vicinity of the finds until they can be verified and the requirements of Public Resources Code 5097.98 are met.

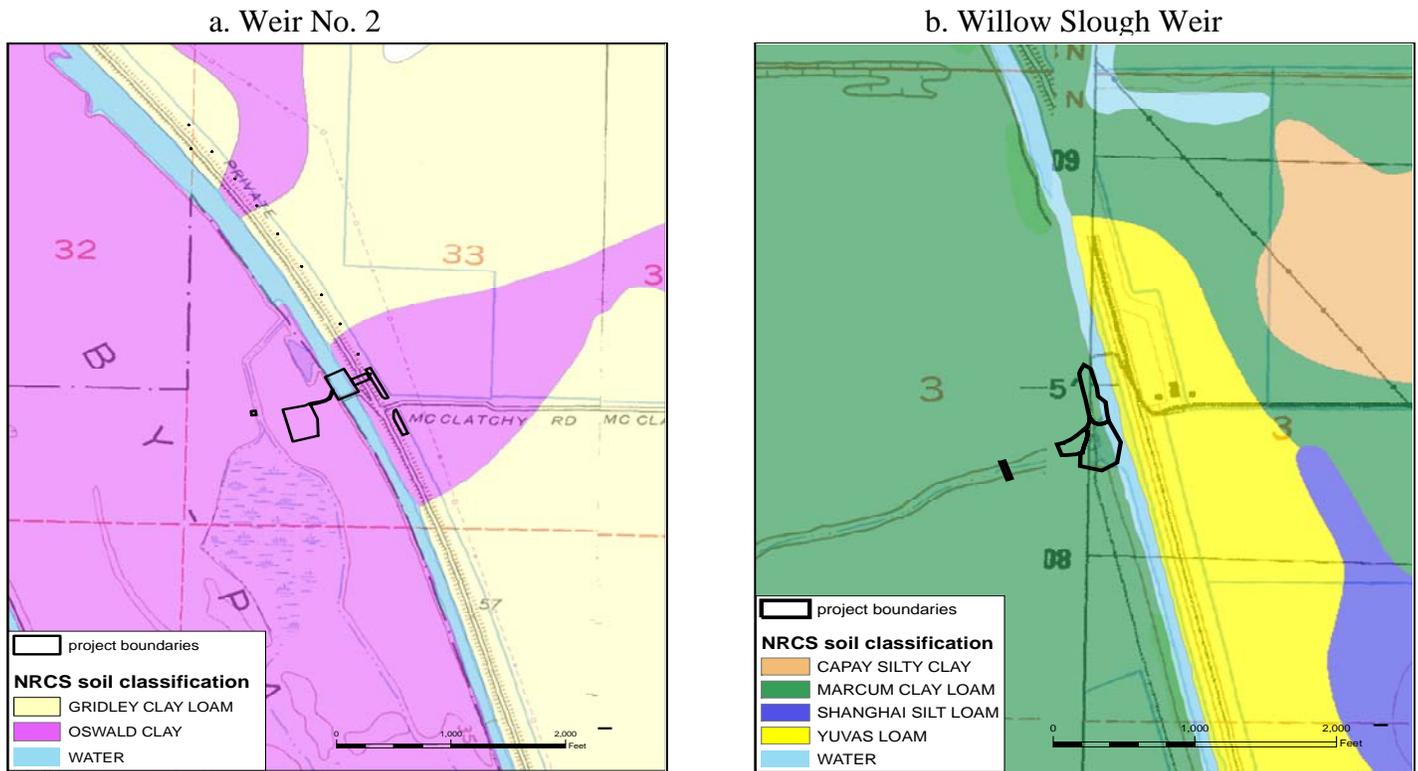
Geology and Soils

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

The project area is in the Sacramento Valley, a wide alluvial plain. Soils found in the area within and adjacent to the project site are predominantly alluvial silt and clay loams (Figure 13).

- a) No impact. The project is not in a seismically active area and is not near any known faults, and therefore will not expose people to rupture of earthquake fault, strong seismic ground shaking, seismic-related ground failure, or landslides.
- b) Less Than Significant Impact. Construction and staging will temporarily disturb soil in the project area. Best Management Practices will be followed for erosion control, and levee banks, streambeds and adjacent uplands disturbed by construction vehicles, constructed ramps will be reseeded with an appropriate seed mix or otherwise treated to reduce erosion and/or siltation. A discussion of erosion control and water quality protection measures which have been incorporated into the project description is included in the “Hydrology” section of this document.
- c) No impact. The geology and soils at the project site will not become unstable as a result of the project.
- d) No impact. The project is not located on expansive soils.
- e) No impact. The project does not involve septic tanks or wastewater disposal.

Figure 13. Soils of the Project Area



Hazards and Hazardous Materials

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Be located on a site which is included on a list of hazardous materials site compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

The construction equipment used for this project will use diesel fuel and oil. However, these materials will be used, stored and disposed of according to standard protocols for handling of hazardous materials. Contracts will require contractors to prepare, and make available to DWR for review and acceptance prior to formal signing, an environmental plan. All personnel involved in use of hazardous materials will be trained in emergency response and spill containment.

DWR determined that neither the wooden flashboards at the Weir No. 2 site nor the proposed wooden temporary fish ladder would be classified as “treated wood waste” under Health and Safety Code (HSC) sections 25143.1.5, 25150.7, or 25150.8. Therefore, DWR plans to dispose of this wood at a non-hazardous waste landfill.

- a) No impact. The project will not create a significant hazard through the routine transport, use, or disposal of hazardous materials. The construction contract requires proper use, storage, and disposal of hazardous materials. It further requires that personnel be trained in emergency response and spill containment.
- b) Less than significant impact. The project will have a less than significant hazard to people due to a reasonably foreseeable accidental release of hazardous materials. Such an accident is unlikely but in the event of an accidental spill of hazardous materials the contractor is required to contain, avoid and minimize the spill by following specifications in the project’s contract. A DWR inspector will be present at all times during construction to enforce the terms and conditions of the contract.
- c) No impact. There are no existing or proposed schools within one-quarter mile of the project site.
- d) No impact. The project site is not a hazardous materials site.
- e) No impact. The project site is not within two miles of a public use airport.
- f) No impact. The project site is not within two miles of a private airstrip.
- g) No impact. The project will not impair or physically interfere with an adopted emergency response or evacuation plan and construction personnel are required to be trained in emergency response and spill containment.
- h) No impact. The project will not expose people or structures to a significant risk loss, injury or death due to wildland fires. The construction contract requires the contractor to prepare a fire prevention and control plan and to provide fire extinguishers, shovels, and other fire fighting equipment on site.

Hydrology and Water Quality

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
d) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
e) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
f) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

provide substantial additional sources of polluted runoff?

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|---|
| g) Otherwise substantially degrade water quality? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | X |
| h) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | X |
| i) Place within a 100-year flood hazard area structures which would impede or redirect flood flows? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | X |
| j) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | X |
| k) Inundation by seiche, tsunami, or mudflow? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | X |

An important objective of the project is to improve regulation of flows through the weirs by replacing the existing water control structures with new structures. At the Weir No. 2 site, the manually controlled flashboard weir will be replaced with an automated gate structure which can be operated remotely from a new control building on the east side levee. At the Willow Slough Weir site, the existing culverts will be replaced with four new culverts, which effectively double the capacity of water flowing through the weir.

Flows in the EBC are regulated primarily to alleviate flooding in the Sacramento Valley resulting from excessive flows in Butte Creek and the Sacramento and Feather Rivers, and to accommodate diversions by water right holders along the canal and allow landowners to drain their fields during certain times of the year. There are approximately 46 individual pumps and three large DWR pumping stations along the canal. The USFWS Sutter National Wildlife Refuge (SNWR) diverts water from the EBC at an intake located approximately ½ mile upstream from Weir No. 2. Land adjacent to the canal is used for agricultural or wildlife enhancement purposes (duck clubs and waterfowl habitat).

~~The project will not substantially alter flows in the EBC or Willow Slough, because the water surface elevation of these waterways will be regulated and maintained throughout the duration of the project.~~ DWR engineers have designed the project so that Sutter Maintenance Yard can continue to regulate and maintain water surface elevation of these waterways throughout the duration of the project.

At Weir No. 2, Sutter Maintenance Yard staff maintains an upstream water surface elevation of 37.5 feet to 38.5 feet (USED), which is required for upstream irrigators and habitat management

for essentially the entire year. The available hydrology data for this weir within the EBC are very limited. A staff gage located upstream of the weir and a downstream staff gage (installed July 2001) provide the only direct data at the site. Staff gages are also located upstream at Pumping Plant No. 3 and downstream at Pumping Plants No. 2 and No. 1. Replacement of Weir No. 2 will ensure a more reliable water supply for the gravity-fed diversion to SNWR because the new structure is better designed for maintaining the water surface elevation upstream of Weir No. 2.

The water surface elevation upstream of Willow Slough Weir will be maintained throughout the duration of the project. Currently, according to the draft operations manual, SMY staff maintains the normal water surface elevation in the EBC at the location of Pumping Plant No. 1 between a stage of 27.5 feet and 29.5 feet (USED). The first and last water surface elevation adjustments to be made at Willow Slough Weir are made at the existing fish ladder to maximize fish passage. With the fish ladder wide open, adjustments thereafter are made first at culverts nos. 1 and 2, then culvert no. 3. When all the gates are open and the water surface elevation in the EBC is rising, water starts spilling into Nelson Slough downstream of Willow Slough in the EBC at a stage of 29.7 feet (USED).

Figure 14. Existing Fish Ladder and Culverts at Willow Slough Weir



The stage at Willow Slough Weir is monitored by the stage readings at Pumping Plant No.1, approximately 1.3 miles upstream in the EBC and by the DWR gauging station, approximately 0.1 miles downstream in Willow Slough.

During the construction period, water flow from the EBC will be conveyed through the existing concrete culvert in Willow Slough Weir into Willow Slough at a minimum of 40 cfs (providing such flow is available from the EBC). The minimum flow of 40cfs has been established based on the M&T Chico Ranch/Llano Seco Rancho fish screen and pumping facility's agreement not to divert 40 cfs of their long held water right out of Butte Creek (October 1 through June 30). Water

that would otherwise have been diverted from Butte Creek will remain instream and be dedicated to fishery and habitat enhancement in Butte Creek, between the Parrott-Phelan Dam and the confluences of Butte Creek with the Sacramento River. **Per baseline operating conditions,** excess flow at Willow Slough Weir will be conveyed approximately 1.3 mi downstream through the EBC to Nelson Slough.

A detailed description of hydrology as well as existing and future operations of the weirs are included in the Preliminary Engineering Reports (Appendix A and Appendix B). An additional description of the operational procedures for the weirs is included in Appendix H.

Water quality in the EBC and Willow Slough may be impacted by temporary increases in turbidity caused by disruption of soils during construction activities or by accidental spills of hazardous materials (petroleum fuels and oils). The project is designed to avoid and minimize impacts to water quality to a less than significant level. All staging areas are located on uplands near the project sites and instream construction work will be conducted in the dry behind sheet pile cofferdams. Excavated soil will be removed and disposed of at an offsite location. Vehicles and equipment will be routinely inspected and repaired as needed, and all vehicles will be refueled at a designated site within the staging area that will have all necessary spill prevention and containment.

The following erosion control and water quality protection measures have been incorporated into the project description:

~~1. Straw mulch will be applied, and anchored down before heavy equipment use begins on the site, to all staging areas, access roads and areas of bare soil to control soil erosion from wind or rainfall during winter and after the completion of construction.~~ **(Note: This erosion control measure is not necessary or appropriate),**

2. All soil/fill stockpiles shall be covered, stabilized, or protected with a temporary linear sediment barrier prior to the onset of precipitation.

3. Soil in non-active areas will be stabilized within 4 days from the cessation of soil disturbing activities or one day prior to the onset of precipitation, whichever occurs first.

4. Any digging or trenching activities will be scheduled so that most open portions are closed before digging in new areas begins.

5. When rainfall is predicted, the construction schedule will be adjusted to allow the implementation of any necessary soil stabilization and sediment controls on all disturbed areas prior to the onset of rain.

6. Cleaning of vehicles and equipment with soap, solvents or steam shall not occur on the project site.

7. All vehicles will be refueled at a designated site within the staging area that will have all necessary spill prevention and containment measures available.

8. Equipment will be parked over plastic sheeting or equivalent where possible.

9. Equipment will be routinely inspected and repaired as needed (e.g., worn or damaged hoses, fittings, gaskets). Any critical maintenance that needs to be performed on-site will utilize drip pans or absorbent pads to catch any escaped fluids. Spill kits and cleanup materials will be available at all locations.

10. Implementation of these measures will be inspected:

- At least every two weeks.
- As directed by BMP Inspection Requirements or the Resident Engineer.
- Prior to a forecast rainstorm.
- After a rain event that causes runoff from the construction site.
- As specified in the project Special Provisions and/or SWPPP.

With the incorporation of best management practices, erosion control and conservation measures, and the implementation of a Stormwater Pollution Prevention Plan (SWPPP), no significant impacts to water quality are anticipated to occur from the proposed project.

- a) Less than significant impact. DWR will comply with any requirements identified by the Regional Water Quality Control Board and the contractor will prepare and implement a SWPPP. All material placed in the upland staging areas will not be subject to flooding, mobilization of soluble metals or affect groundwater. The project is designed to avoid violation of any water quality standards and to follow waste discharge requirements.
- b) No impact. The project will not deplete groundwater supplies or interfere with groundwater recharge.
- c) Less than significant impact. The project would not substantially alter the existing drainage pattern of the area in a manner that would result in substantial erosion. ~~Flow would temporarily be altered at the Weir No. 2 site during each phase of construction from May to October in 2009 and 2010. Flow would be temporarily altered at the Willow Slough site during construction by diverting water from the EBC through the existing concrete culvert and temporary fish ladder into Willow Slough as well as diverting excess water through Nelson Slough. The alteration in flow is not anticipated to cause a significant increase in erosion or siltation.~~ (Note: For additional details see Appendix N.)

Construction activities adjacent to the EBC and within the channel would temporarily disturb soils and could cause sediment to be transported through the EBC or Willow Slough. Disturbances to the bed and bank of the channel would result in temporary increases in turbidity and sedimentation downstream of the construction sites. These impacts will be reduced to less than significant levels with conservation and erosion control measures incorporated into the project as described above. Work or equipment operation will be avoided in flowing water during in-channel activities by constructing cofferdams and diverting all flows around construction sites. Additionally, in-channel activities will be limited to a relatively low-precipitation period (May – October). Removal of vegetation will be restricted to the minimum amount required. All construction equipment, materials, fill, and excavated soil will be stored out of the stream in the designated staging areas. All disturbed areas such as staging areas and the widened levee at the Weir No. 2 site will be identified and upon completion of construction will be

reseeded with an appropriate seed mix or otherwise treated to reduce erosion and/or siltation. The project will include implementation of a SWPPP, protection of soil/fill stockpiles in staging areas, proper installation of cofferdams, site restoration, and post-construction monitoring.

- d) Less than significant impact. The project would not significantly impact federally protected wetlands as defined by Section 404 of the Clean Water Act. Potential impacts to wetlands and water of the U.S. are discussed in the “Biological Resources” section of this document.
- e) Less than significant impact. The project would not substantially alter the existing drainage pattern of the area in a manner that would result in substantial flooding. At the Weir No. 2 site, water in the EBC will be controlled through half of the weir, during each phase of construction. At the Willow Slough Weir site, water will be directed through the existing concrete culvert in the weir. It is anticipated that when the stage exceeds 29.7 ft USED upstream of Willow Slough Weir, water will continue to be conveyed through the EBC to Nelson Slough during the construction period; the capacity of Nelson Slough appears sufficient to contain the additional flow. Nelson Slough regularly floods during wet years when the entire Sutter Bypass is inundated. Onsite revegetation of shaded riverine habitat at the Willow Slough Weir site will not impede passage of the project’s design flows. Sutter Maintenance Yard staff will continue to maintain the upstream stage elevation by operating the weirs throughout the construction period. The project will not alter the drainage pattern of the area which would result in substantial flooding during the construction period or through the long-term operations of the weirs. A primary purpose of the project is to improve the ability of the water control structures to regulate flows through the weirs and carry flood flows. Flow would be temporarily altered at the Willow Slough site during construction. It is anticipated that excess flow will be directed through Nelson Slough during the construction period; the capacity of Nelson Slough appears sufficient to contain the additional flow. Nelson Slough regularly floods during wet years when the entire Sutter Bypass is inundated. Onsite revegetation of shaded riverine habitat at the Willow Slough Weir site will not impede passage of the project’s design flows. While the course of water flowing in the EBC will be altered temporarily, a primary purpose of the project is to improve the ability of the water control structures to regulate flows through the weir and carry flood flows. Therefore, impacts would be considered less than significant. (Note: For additional details see Appendix N.)
- f) No impact. The project will not increase the capacity of a stormwater drainage system.
- g) No impact. The project will comply with Regional Water Quality Control Board permit conditions and will not substantially degrade water quality, as described above.
- h) No impact. The project will not place housing in a 100-year flood hazard area.
- i) No impact. The project includes construction of temporary and permanent instream structures. Installation of temporary cofferdams at both sites may will redirect flow around and downstream of the construction site. At the Willow Slough site, the cofferdams will be in place from May to October, during relatively low flows. The cofferdams at the Weir No. 2 site will remain in place for a longer period of time (from May 2008 to October 2010) and may be inundated with high flows during the winter of 2009. Permanent instream structures will replace the existing structures within the EBC

of the Sutter Bypass. The current structures were designed to hold upstream water levels at certain elevations for upstream diversions. The new structures are specifically designed to handle flood flows and better regulate flows through the weirs. The potential of the project to impede flood flows is not considered significant because the proposed temporary and permanent structures are not of sufficient size or orientation to cause a substantial change in floodflows within the Bypass and are only replacing or modifying existing structures of a similar size at the same location. The new structures will be designed to comply with Central Valley Flood Protection Board regulations.

- j) No impact. One of the purposes of the project is to improve flood control.
- k) No impact. The project will not expose people or structures to inundation by tsunami, seiche, or mudflow.

Land Use and Planning

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

The project area lies within Sutter County, in a rural area far from any permanent settlement. The nearest large residential communities are Marysville and Yuba City, which are about 15 miles to the northeast.

- a) No impact. The project would not physically divide a community.
- b) No impact. The project purpose is the replacement of existing weirs and fish ladders, and no changes in land use are planned or expected.
- c) No impact. The project will not conflict with the Yuba/Sutter NCCP/HCP. A discussion of this plan is included above in the “Biological Resources” section.

Mineral Resources

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

There are currently no mineral extraction activities in or near the project site.

- a) No impact. The project would not result in the loss of a known mineral resource.
- b) No impact. The project would not result in the loss of a locally important mineral resource recovery site.

Noise

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

The project is in a rural area with generally lower noise levels than in urban areas. The ambient noise environment can be characterized as quiet and largely unaffected by human-made noise sources. Noise impacts could be considered significant if sensitive noise receptors such as residential units, hotels, schools, and churches were located near the project site.

The Sutter County General Plan has set a noise standard of 60 dB for existing residential uses. The project will generate noise due to the operation of heavy equipment during excavation and that activity will take not take place near any sensitive receptors, including hospitals or healthcare facilities, libraries, parks, or schools. Nonetheless, all equipment will utilize appropriate mufflers and work will generally be limited to daylight hours. Bulldozers and graders can generate noise levels of 87 dBA (average A-weighted noise level at 50 feet). The sound drop off rate is 6 dBA/doubling of distance (Entrix 1996).

- a) Less than significant impact. Noise levels will increase due to operation of heavy equipment during construction. However, contractors will comply with applicable local, state, and federal regulations regarding noise attenuation and ensure that all engine-driven equipment will be fitted with adequate mufflers.
- b) Less than significant impact. Heavy equipment will generate some ground borne vibration, but not in the immediate vicinity of any occupied residences, thus residents will not likely be affected.
- c) No impact. No permanent increase in noise levels will occur due to the project.
- d) Less than significant impact. The ambient noise at the project site is fairly quiet (if consistent with other undeveloped rural settings, approximately 40 dB). Noise sources include wind in the trees, birds, and distant farm equipment. While the construction equipment is working, ambient noise levels will increase. However, all equipment will be properly tuned and will utilize appropriate mufflers, and work will generally be limited to daylight hours. If night shifts become necessary, it will be limited to a distance of at least 1/2 mile from the nearest residence.
- e) No impact. The project is not within two miles of a public airport.
- f) No impact. The project site is not within two miles of a private airstrip.

Population and Housing

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

The project will have no impact on population growth or housing within the project area.

- a) No impact. This project will replace weirs that serve existing irrigation diversions, ~~and~~ replace existing fish ladders, and will not directly or indirectly induce population growth.
- b) No impact. This project will not displace existing housing.
- c) No impact. This project will not displace any people.

Public Services

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Fire: Will the project require additional staff or equipment to maintain an acceptable level of service (i.e., response time, equipment capacity)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Police: Will the project require additional staff or equipment to maintain acceptable service ratios, response times or other performance objectives?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Schools: Will the project increase the population of school-age children in a K-12 school district that is or will be operating without adequate staff, equipment, or facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

The project will not result in impacts which would affect or require new or additional public services.

- a) No impact. This project will not require additional staff or equipment for fire protection.
- b) No impact. This project will not require additional staff or equipment for police protection.
- c) No impact. This project will not increase the population of school-age children in the area.
- d) No impact. This project will not require any other additional public services.

Recreation

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

Recreational opportunities around the project area include hiking, birdwatching, hunting and fishing. However, fishing is not allowed in part of the project area because DFG prohibits fishing within 250 feet of the weirs. The project will allow continued flooding of rice fields and wetlands actively managed for recreational use. Implementation of the project will result in a more reliable water diversion system and improved passage conditions for anadromous fish. Therefore, the project can be considered to have beneficial impacts to recreational opportunities.

- a) No impact. There are no facilities or other structural features within or around the project area so the project will not increase the use of existing parks or recreational facilities.
- b) No impact. The proposed project will not include recreational facilities nor will it require new facilities to be built.

Traffic and Transportation

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
f) Result in inadequate parking capacity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

Several state highways and local roads provide access to the project sites at Weir No. 2 and Willow Slough Weir.

Heavy equipment will use the routes shown in Figure 7 to access the Willow Slough Weir site during the construction period. California State Highway 99 to the east of the Willow Slough Weir site provides access from the north and south, and the project site will be accessed from the east by Sacramento Avenue and from the west by Kirkville Road. A temporary vehicle bridge (Figure 9) will be installed to provide access across

Willow Slough to an adjacent landowner, as described in **Appendix N**, the “Project Components” section of this document. The approximate number of truck trips anticipated to occur at the Willow Slough Weir site is listed below:

Summary of Vehicle Traffic at the Willow Slough Weir site

<u>Activity</u>	<u>Truck Round Trips</u>
Mobilization and Demobilization	20
General Excavation and Fill	1300
Cofferdam Installation	600
Fish Ladder Structure	100
Culvert Structures	40
Post Construction Seeding and Revegetation	1

The Weir No. 2 site will be accessed from the east by California State Highway 99 to Bogue Road, then McClatchy Road to the weir. From the west, the site will be accessed from Hughes Road and non-public roads through the USFWS Sutter National Wildlife Refuge (SNWR), for which DWR has obtained a Special Use Permit from USFWS. **(Note: DWR has confirmed that the project area will be accessed through an existing easement.)** Routes to and from Weir No. 2 are identified in Figure 3. These roads will be routinely maintained during the second phase of the project at the Weir No. 2 site and will be restored upon project completion. A small road improvement (Figure 5) will be made to the intersection of the main north-south access road and the short road leading to Weir No. 2 as described in this document in the “Project Components” section. The approximate number of truck trips anticipated to occur at the Weir No. 2 site is listed below:

Summary of Vehicle Traffic at the Weir No. 2 site

<u>Activity</u>	<u>Truck Round Trips</u>
Mobilization and Demobilization	20
General Excavation and Fill	600
Cofferdam Installation	635
Fish Ladder Structure	50
Weir Replacement	67
Riprap	12
Post Construction Seeding	1

The following heavy equipment may be used during the project: track dozers, motor graders, wheel dozers, excavators, dump trucks, scrapers, compactors, concrete and

pumper trucks, flat-back delivery trucks, 5-ton crane, sheet pile hammer, air compressors, and water trucks. A County of Sutter Transportation Permit will be obtained prior to the initiation of the project. DWR will comply with all Sutter County transportation regulations.

Traffic bringing workers to the site will increase during construction activities. Approximately 15-30 workers at each location will commute approximately 15-30 miles each way (e.g., from Sacramento, Marysville, etc.). Concrete will be obtained from a local batch plant located approximately 20 miles from the project sites. Construction equipment and materials will be brought to the site from approximately 15-30 miles away (from Sacramento, Marysville, or Woodland). Most traffic will occur on local roads and will be generated by trucks and other earth-moving and hauling equipment within the Bypass.

The proposed project would generate few vehicle trips during future maintenance operations. Occasional maintenance and patrolling of the proposed weirs and fish ladders would require the use of a limited number of vehicles.

- a) Less than significant impact. Almost all truck traffic will remain within the EBC and on the east Sutter Bypass levee. Information on the existing number of vehicle trips or the volume-to-capacity ratio for several of the local access roads is not available (Sutter County 2008). As material is moved out of the Bypass, the project will not cause a substantial increase in traffic in relation to the traffic and load capacity since most activity will be off of local roads.
- b) Less than significant impact. Local governments adopt level of service (LOS) standards for roadways under their jurisdiction. Sutter County utilizes LOS "D" as the minimum acceptable standard for its roadways, and intends to utilize LOS "C" as the minimum acceptable standard for its roadways in the General Plan update (Sutter County 2008). LOS standards have not been established for several of the access routes to the project area. Traffic due to construction activities would not exceed the LOS for rural Sutter County roads.
- c) No impact. The project will not result in a change in air traffic patterns.
- d) Less than significant impact. The project will not significantly increase hazards. The construction activity is located in an isolated agricultural area and almost all of it will take place within the Bypass except as equipment moves over the levees between the Bypass and the staging areas.
- e) No impact. The project will not negatively impact emergency access.
- f) No impact. No roads, gates, or parking areas will be blocked by project vehicles. Adequate parking is available at both sites for trucks and heavy equipment.

g) No impact. The project will not conflict with alternative transportation plans.

Utilities and Service Systems

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
g) Comply with federal, State, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

The proposed project will not impact utilities or service systems.

- a) No impact. The project will not include wastewater.
- b) No impact. The project will not require or result in new or expanded wastewater treatment facilities.

- c) No impact. The project will not require or result in new or expanded storm water drainage facilities.
- d) No impact. The project will not require a water supply.
- e) No impact. The project will not require wastewater treatment.
- f) No impact. The project will not generate solid waste disposal needs.
- g) No impact. The project will not generate solid waste so these statutes and regulations will not apply.

Mandatory Findings of Significance

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>

This Initial Study (IS) has been prepared to assess the proposed project’s potential effects on the environment and the significance of those effects. Based on the IS, it has been determined that the proposed project would not have any significant effects on the environment because few minor impacts are short term and mitigation and conservation measures will be implemented.

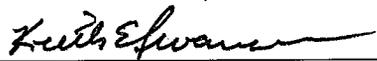
- a) Less than significant with mitigation incorporation. The project will not significantly change the existing environment because it is largely confined to previously disturbed areas, and the objective of the project is replacement of existing structures. The Willow Slough Weir project includes the loss of a small amount of shaded riparian habitat, but a mitigation and monitoring plan will ensure that the habitat is replaced. Loss of Giant Garter Snake habitat will be mitigated by purchasing replacement mitigation lands at an approved Giant Garter

Snake mitigation bank. Potential impacts to other special-status fish, birds, reptiles, and plants have been identified but proposed avoidance and mitigation measures, which are described in the “Biological Resources” section, will reduce or eliminate the potential impacts to less than significant or avoid them completely.

- b) Less than significant. Similar flood control maintenance projects have occurred in the Sutter Bypass in the past and will likely occur in the future. Cumulative effects are not significant because most impacts are temporary and are designed to be avoided or minimized through best management practices.
- c) Less than significant. Potential impacts to agricultural resources, air quality, ~~biological resources~~, geology and soils, hydrology and water quality, and noise will be short term and either less than significant or have no impact as a result of the project. ~~from implementation of the mitigation measures specified throughout the checklist.~~ The proposed project will not cause substantial adverse effects on human beings.

V. Determination

On the basis of the Initial Study, I find that the project, as mitigated by the measures discussed within this document and adopted by the Department of Water Resources, will not have a significant effect on the environment. A Mitigated Negative Declaration will be submitted.



Keith Swanson, Chief *Flood Maintenance Office*
Division of Flood Management, California Dept. of Water Resources

Agencies Consulted

- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- NOAA's National Marine Fisheries Service (NOAA Fisheries)
- CA Department of Fish and Game
- Central Valley Regional Water Quality Control Board
- Sutter County
- Central Valley Flood Protection Board
- State Lands Commission
- U.S. Bureau of Reclamation
- Reclamation District 1660
- Reclamation District 1500
- Levee District 1

References

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List of Appendices

- Appendix A. Weir No. 2 Preliminary Engineering Technical Report
- Appendix B. Willow Slough Weir Preliminary Engineering Technical Report
- Appendix C. Temporary Fish Passage at Willow Slough Weir
- Appendix D. Proposed filling of concrete culvert at Willow Slough Weir
- Appendix E. General Conservation Information for Giant Garter Snakes
- Appendix F. Previous Correspondence for the Proposed Project
- Appendix G. MOU Between The DFG And DWR's DFM
- Appendix H. Operational procedures for Willow Slough Weir and Weir No 2
- Appendix I. USFWS official species list for USGS quadrangles
- Appendix J. Fish Rescue Plan During Dewatering
- Appendix K. USFWS Giant Garter Snake Programmatic Biological Opinion
- Appendix L. Mitigation and Monitoring Compliance
- Appendix M. Impact Avoidance and Minimization Measures

Responsible Personnel

The mitigated Negative Declaration and Initial Study were prepared for:

Keith Swanson, Principal Engineer
California Department of Water Resources
Division of Flood Management, Flood Maintenance Office
3310 El Camino Avenue
Sacramento, CA 94236-0001

Prepared by:

California Department of Water Resources
Division of Planning and Local Assistance, Resource Restoration and Project
Support
901 P St.
Sacramento, CA 95814

Authors:

Harry Spanglet, Staff Environmental Scientist
James Newcomb, Environmental Scientist
Megan Sheely, Environmental Scientist
Joseph Chang, Senior Engineer
Nancy Snodgrass, Engineer

Contact for Initial Study and Mitigated Negative Declaration:

Harry Spanglet, Staff Environmental Scientist
(916) 651-9608
spanglet@water.ca.gov