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
September 2009

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State of California	**The Resources Agency**	**Department of Water Resources**

State of California

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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~~ that will perform the same functions as the existing weir. Construction will occur over two seasons, from May to October of ~~2009~~ 2010, and from May to October of ~~2010~~ 2011.

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. In both locations, the existing weir will be removed; the new Willow Slough Weir will be constructed in the same location as the old weir, and the new Weir No. 2 will be constructed on a site approximately one hundred feet downstream from the existing weir.

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 structure will be located approximately 100 feet

downstream of the existing structure. 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. 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. 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, any impact 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 minimize potentially significant adverse impacts to

biological resources 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.

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.
- Implement best management practices during impact pile driving to minimize impacts to special status salmonids.
- Conduct inspections of impact pile driving activities during construction. Biological monitors will notify DFG and NOAA Fisheries if pile driving causes adverse impacts to listed fish species.
- 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 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.
- Require Contractor to prepare and implement both a Traffic and Noise Abatement Plan and an Air Quality Control Plan to minimize traffic and construction-related impacts.
- Conduct inspections daily during the regular work week to ensure areas outside construction area have remained undisturbed: Inspections will reduce the chance of accidental disturbance.

- Should any cultural resources, such as structural features, unusual amounts of bone or shell, artifacts, human remains, or architectural remains, be encountered during any construction activities, work shall be suspended immediately at the location of the find and within an appropriate radius. A qualified DWR archaeologist will conduct a field investigation of the specific site and recommend mitigation deemed necessary for the protection or recovery of any cultural resource concluded by the archaeologist to represent historical resources or unique archaeological resources. DWR shall be responsible for approval of recommended mitigation if it is determined feasible in light of approved land uses, and shall implement the approved mitigation before resuming construction activities at the archaeological site. Discoveries of human remains shall be treated as described below

- In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, the contractor or DWR shall immediately halt potentially damaging excavation in the area of the burial and notify the Sutter County Coroner, and a DWR in-house archaeologist/cultural resource specialist to determine the nature of the remains. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the NAHC by phone within 24 hours of making that determination (Health and Safety Code Section 7050[c]). The Most Likely Descendant (MLD) designated by the NAHC shall determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed as provided for in California Public Resources Code (PRC) Section 5097.98, in consultation with DWR and the landowner, subject to the limitations provided in Section 5097.98. Adherence to these procedures and other provisions of the California Health and Safety Code and PRC will reduce potential impacts on human remains to a less-than-significant level.

- Re-plant riparian vegetation, with appropriate irrigation capabilities, at Willow Slough Weir and Weir No. 2: DWR will re-establish riparian and shaded riverine aquatic habitats.
- Restore the original access road at the Weir No. 2 site. DWR will re-vegetate the abandoned section of road and establish goals for the revegetation effort.
- 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 U.S. 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.
- 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

Keith E. Swanson, Principal Engineer
Division of Flood Management

Date 9/8/09

Initial Study

for

Sutter Bypass East Borrow Canal Water Control Structures

Prepared by:

Division of Planning and Local Assistance
Department of Water Resources
September 2009

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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 new structures 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~~ Flood Safe Environmental Stewardship and Statewide Resources Office. 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~~ that will perform the same functions as the existing weir. The new Weir No. 2 and its fish ladder will be constructed approximately 100 feet downstream from the existing structures; the new Willow Slough Weir and its fish ladder will be constructed on the same site as the existing structures (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 (20~~09~~10 and 201~~0~~1). 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~~ at the site of an abandoned bridge crossing, 100 feet downstream of the existing weir structure. The new fish ladder will be built on the east bank of the EBC, on the bank opposite the existing fish ladder; the existing fish ladder, ~~on the west bank~~ 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 adjacent to the new Weir No. 2 location at the top of the east side levee of the EBC, which will be widened. ~~and e~~Electric lines will be installed along the east side of the levee to provide power to the control building.

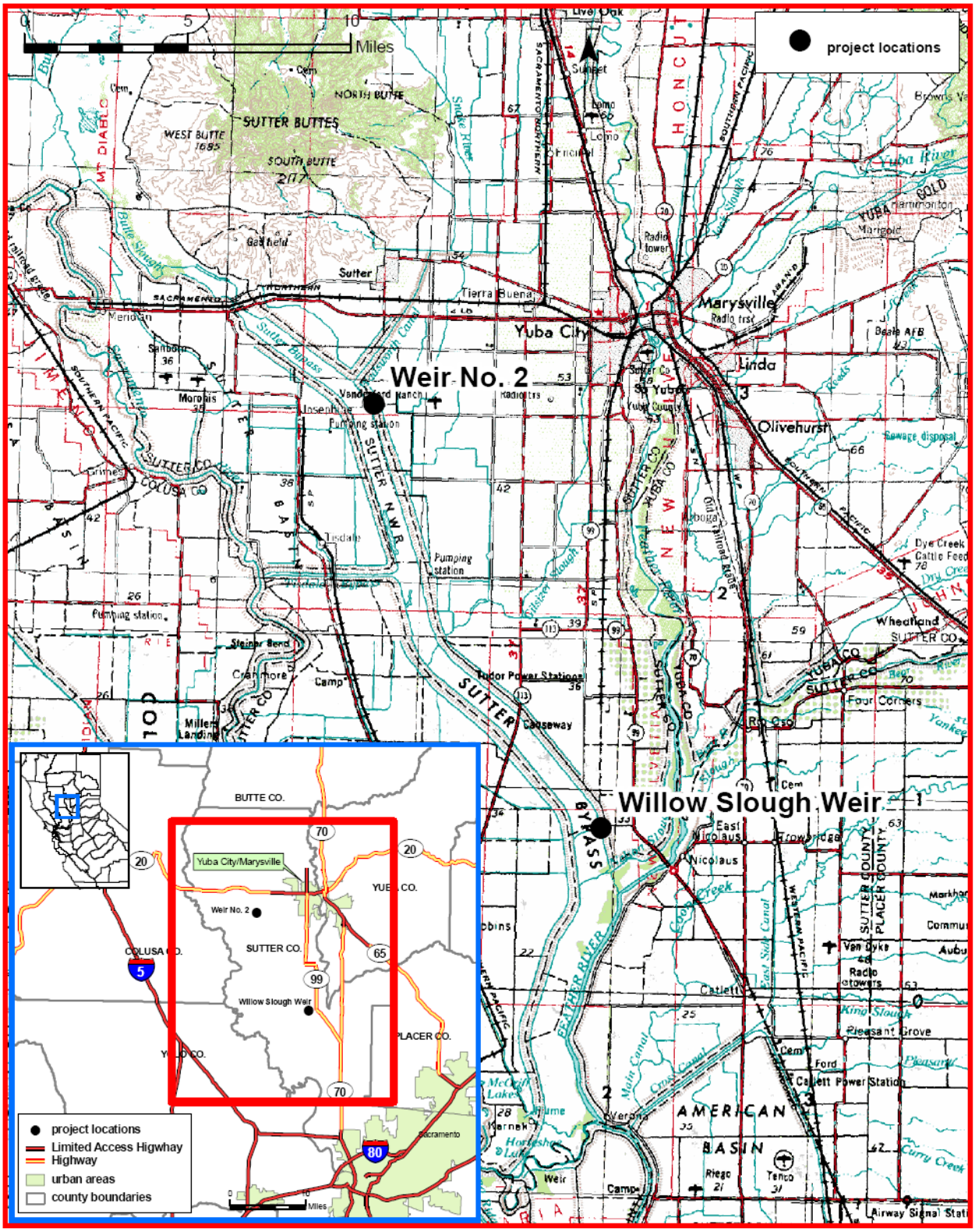
Phase 1 of the project will occur from May 1, 20~~09~~10 to mid-October 20~~09~~10. Phase 2 of the project will occur from May 1, 20~~10~~11. to mid-October 20~~10~~11. The construction windows are devised to avoid impacts to sensitive species.

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, 20~~09~~10 and October 1, 20~~09~~10. 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~~ three components:

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

The new flow control structure will be built at ~~the same~~ a location ~~as~~ 100 feet downstream (south) of the existing weir structure, with ~~T~~the new fish ladder located on the east side of the EBC, on the bank opposite the existing fish ladder, which will subsequently be removed. A small control building for the operation of the automated gates will be constructed adjacent to the new weir at the top of the east side levee of the EBC, which will be widened.

The Weir No. 2 project area (Figure 2) is 4.61 acres in total, of which 2.56 acres will be used as staging areas, 1.61 acres are construction area, 0.09 acre is existing roads, 0.31acre is an area of vegetation clearing for road and weir construction, and 0.07 acre is road work (road improvement and new access road construction). 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 that provides anadromous fish passage at all times. In each season construction will take place only between May 1 and 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, 20~~09~~10 and October 1, 20~~09~~10. 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, 20~~09~~10 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, 20~~09~~10, metal sheet-piling cofferdams will be installed with vibratory or impact drivers in the eastern half of the EBC channel ~~upstream and downstream of the weir~~ to isolate the eastern half of the new weir construction area, and the site will be dewatered to permit construction ~~of the weir~~. The existing fish ladder ~~on~~ and the ~~western half of the~~ existing weir will remain operational throughout this phase.

3) ~~Removal and replacement~~ Construction of the east half of the ~~existing~~ new weir and the new fish ladder. ~~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 case (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.~~ Within the dewatered construction area, the channel bottom will be excavated and the existing abandoned bridge piers will be removed. Approximately 4,000 cy of excavated material will be removed to an approved off-site disposal area, and approximately 1,000 cy will be used within the new weir. Approximately 3,000 cy of new fill will be brought in by dump truck for the levee embankment. Approximately 1,700 cy. of slurry will be used in the new weir foundation (instead of clay). Permanent sheet piles will also be installed using vibratory or impact drivers to form the new foundation. The eastern half of the new weir and the new fish ladder will then be constructed. After construction has been completed, the sheet pile cofferdams will be removed. ~~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~~ eleven 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 1, 20~~09~~10.

The second phase of the project will take place between May 1, 20~~10~~11 and October 1, 20~~10~~11. It will consist of:

1) Construction of a new access road from existing access routes in the Sutter National Wildlife Refuge (SNWR). The location of the new weir structure will require construction of a small access road to the site (Figure 5). The new access road will follow an old, abandoned alignment of McClatchey Road and will require clearing of approx. 0.03 acre of generally immature (> 4" dbh) woody riparian vegetation followed by grading of the new road. The original road will be restored and revegetated.

2) Maintenance and minor improvement of existing 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 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~~6). A small amount of fill (est. 50 cubic yards (yd^3)) and 12-inch riprap (est. 20 yd^3) 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.

3) 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.

~~4) 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.~~

5) Construction of cofferdams and site dewatering. On or after May 1, 20~~10~~11, metal sheet-piling cofferdams will be installed with vibratory or impact drivers in the western half of the EBC channel ~~upstream and downstream of the weir~~ , adjacent to the newly constructed eastern half of the weir and the fish ladder, to isolate the construction area for the western half of the new 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.

6) Installation of permanent sheet piles and riprap on the west bank of the EBC. Metal sheetpiles will be installed along the EBC bank, immediately upstream (north) of the new weir, to retain 1,300 cubic yards (cy) of rip rap that will be placed for erosion protection. The permanent sheetpiles will be installed using vibratory or impact pile drivers. Total rip rap for the project would be 1,500 cy.

7) ~~Removal and replacement of the~~ Construction of western half of the new ~~existing~~ weir. ~~The remaining half of the weir structure will be demolished. and removed to an approved off-site disposal area~~. Within the dewatered construction area, the channel bottom will be excavated and approximately 2,000 cy of excavated material will be removed to an approved off-site disposal area. Permanent sheet piles will be installed using vibratory or impact drivers and approximately 850 cy of slurry (instead of clay) will be used to build the new weir foundation. The western half of the weir and fish ladder will then be constructed on the new foundation.

8) Removal of western sheet-piling cofferdam. After construction of weir is completed, the sheet-pilings will be removed ~~with a vibratory driver~~.

9) Closing of the new weir, diversion of flow through new weir and fish ladder. Upon completion of the western half the new weir will be put into operation, maintaining elevated water elevations on the EBC, and flow will be diverted through the fish ladder to provide anadromous fish passage.

10) Demolition/removal of existing weir and fish ladder. After the new weir and fish ladder are operational, the old structures will be removed. Half of the old weir will be isolated and dewatered using sheetpile cofferdams, which will be installed with a vibratory or impact driver. The dewatered half of the weir will be removed and disposed of off-site. The demolition area will be re-opened and the sheetpiles will be removed. The same procedure will be used to remove the remaining half of the structure. An elevated water surface elevation and anadromous fish passage will be maintained at all times.

11) 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 1, 20~~10~~11.

Figure 2. Weir No. 2 Project Area

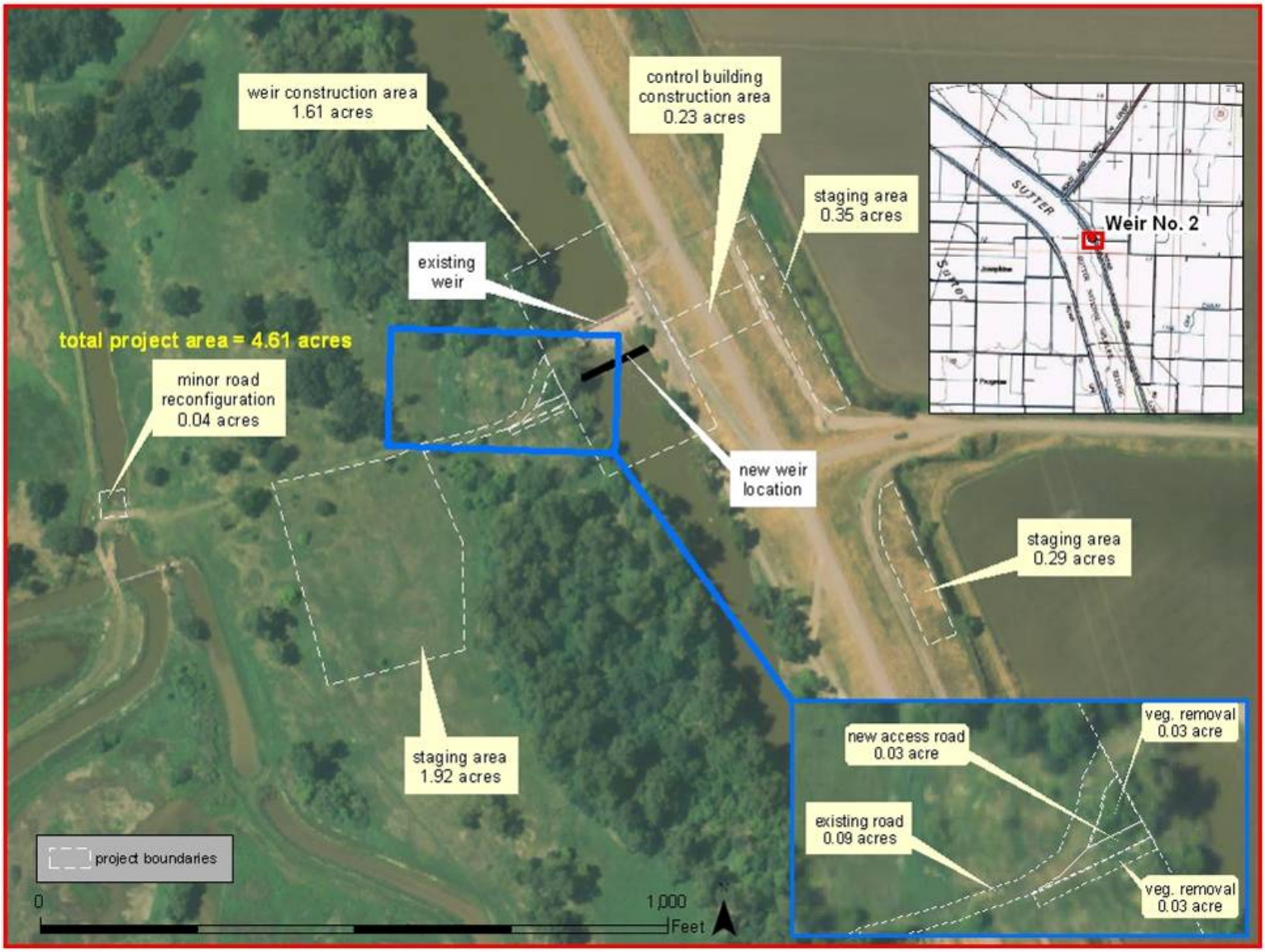


Figure 3. Access Routes to Weir No. 2

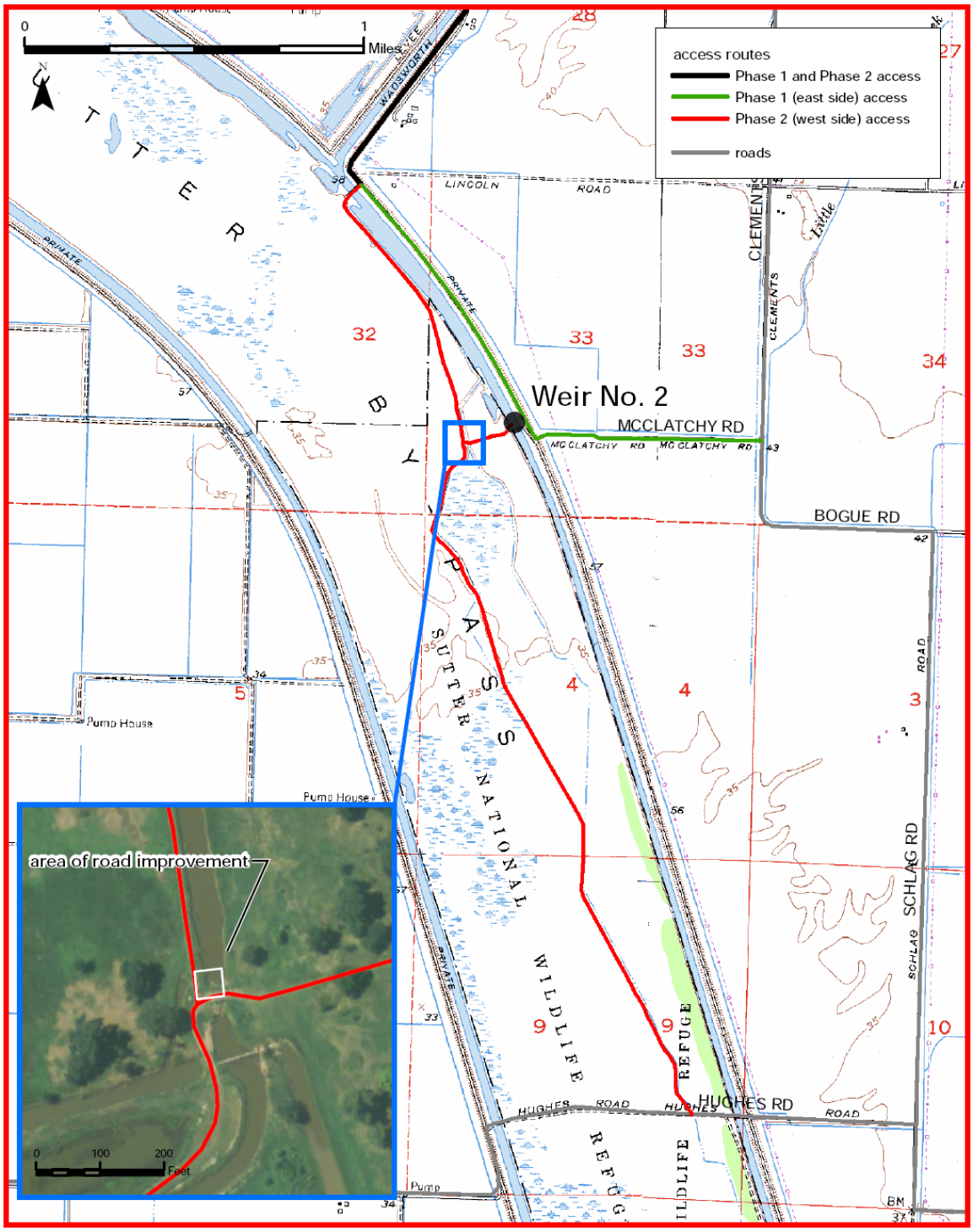


Figure 4. Proposed Locations of Utility Poles at Weir No. 2

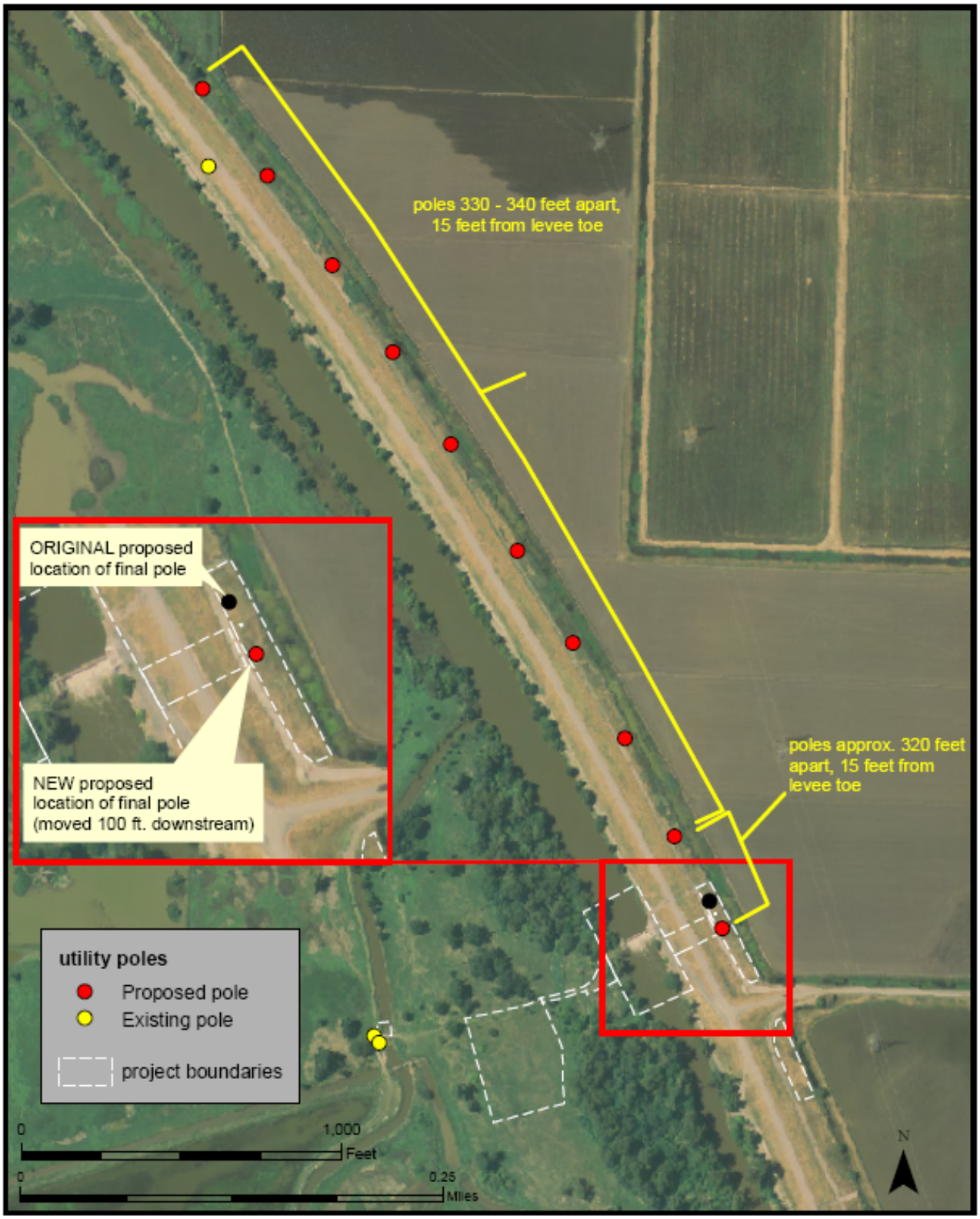


Figure 5. Location of new planned access road at Weir No. 2

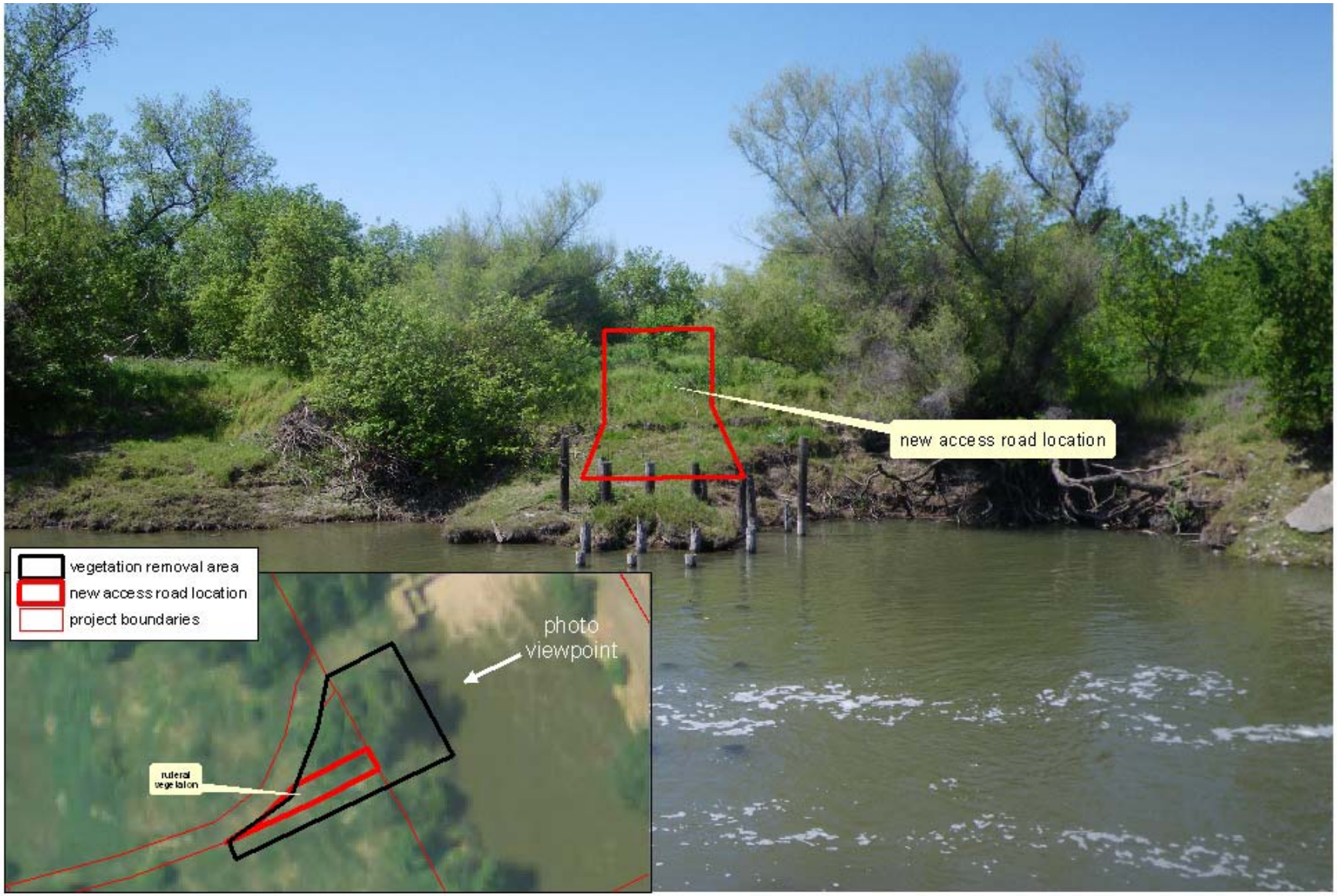


Figure 6. Improvement to Access Road at Weir No. 2

Willow Slough Weir

The Willow Slough Weir project area (Figure 7) is ~~3.84~~ 3.73 acres in total, of which 1.75 acres are staging area and 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 8).

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 9) 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 will be installed ~~approximately 500 ft downstream of~~ across Willow Slough at the eastern end of the construction area (Figure 10), ~~the construction~~ area with ~~one~~ two support beams 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. In consultation with adjacent landowners, the proposed location of the bridge was moved to a more feasible location. The new location is within the boundaries of the constructions area, instead of in a separate location, so the total project area is reduced by 0.11 acres (new

total = 3.73 acres). (see Appendix N for additional details regarding design of the temporary bridge)

Construction will take place between May 1, 20~~09~~10 and October 1, 20~~09~~10. The construction process will consist of:

1. Preparation of staging areas. On or after May 1, 20~~09~~10 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 or impact 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. Sheet pile abutments will be filled with approximately 600 cy compacted backfill to provide support for the temporary bridge abutments. The rail car bridge(s) will be installed using a large crane (Figure 10).
    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 or impact 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, 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 or impact 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 U.S. 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 no greater than ~~approximately 7,000~~ 16,000 cubic

yards of fill material, assuming a 3:1 slope, ~~If existing weir material is inadequate, then new fill material~~ that will be brought in on trucks via Kirkville Road, in an estimated ~~700~~ 1600 trips over 23 days. The proposed slope for the new proposed weir was changed from 2:1 to 3:1 on the basis of additional review of geotechnical information, which increases the amount of fill needed to complete the project.

6. 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.
7. 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.
8. 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.
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 or impact 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
10. Removal of temporary vehicle 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.

~~10)~~ 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)

11) 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 1, 20~~09~~10.

Figure 7. Willow Slough Weir Project Area

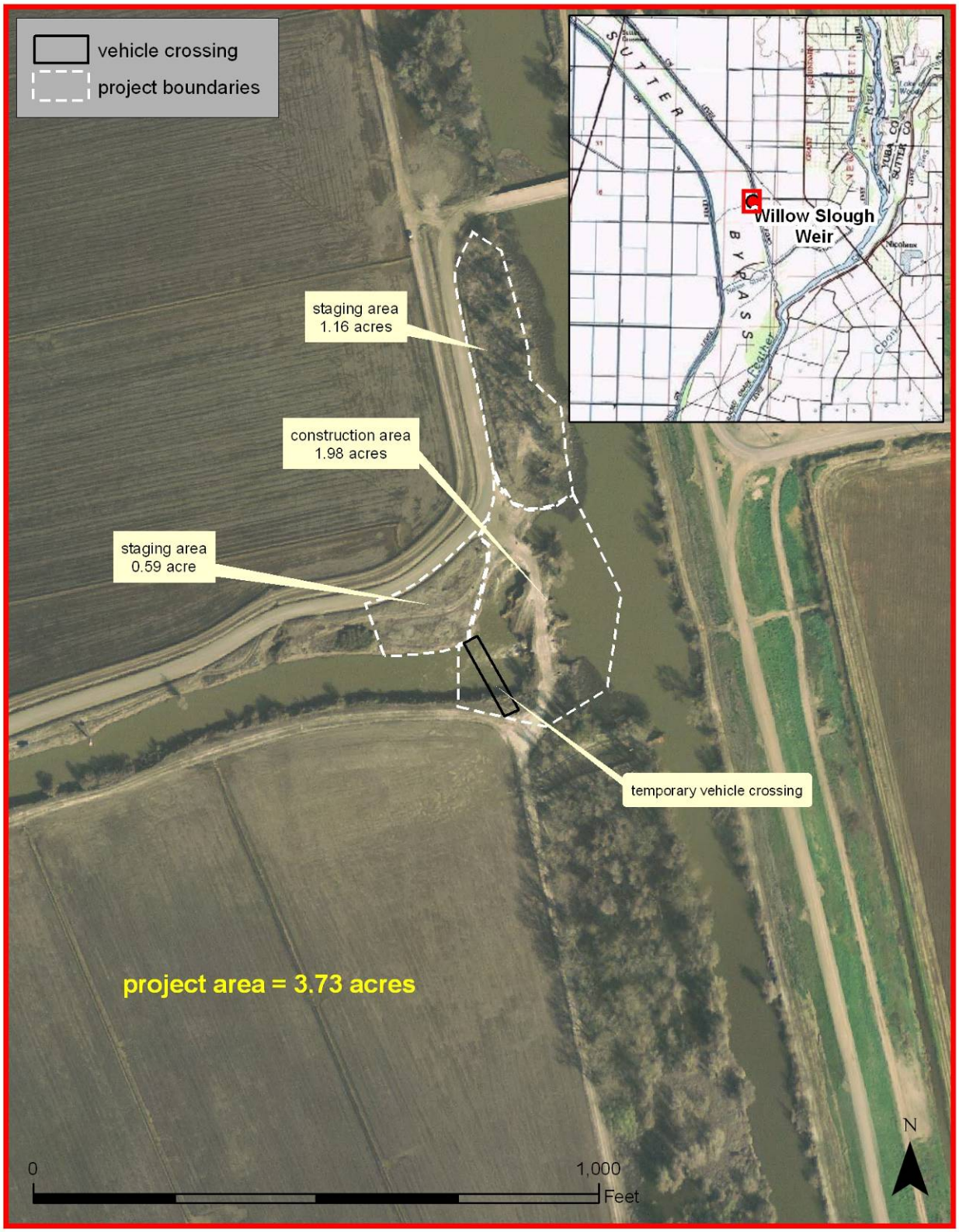


Figure 8. Access Route to Willow Slough Weir

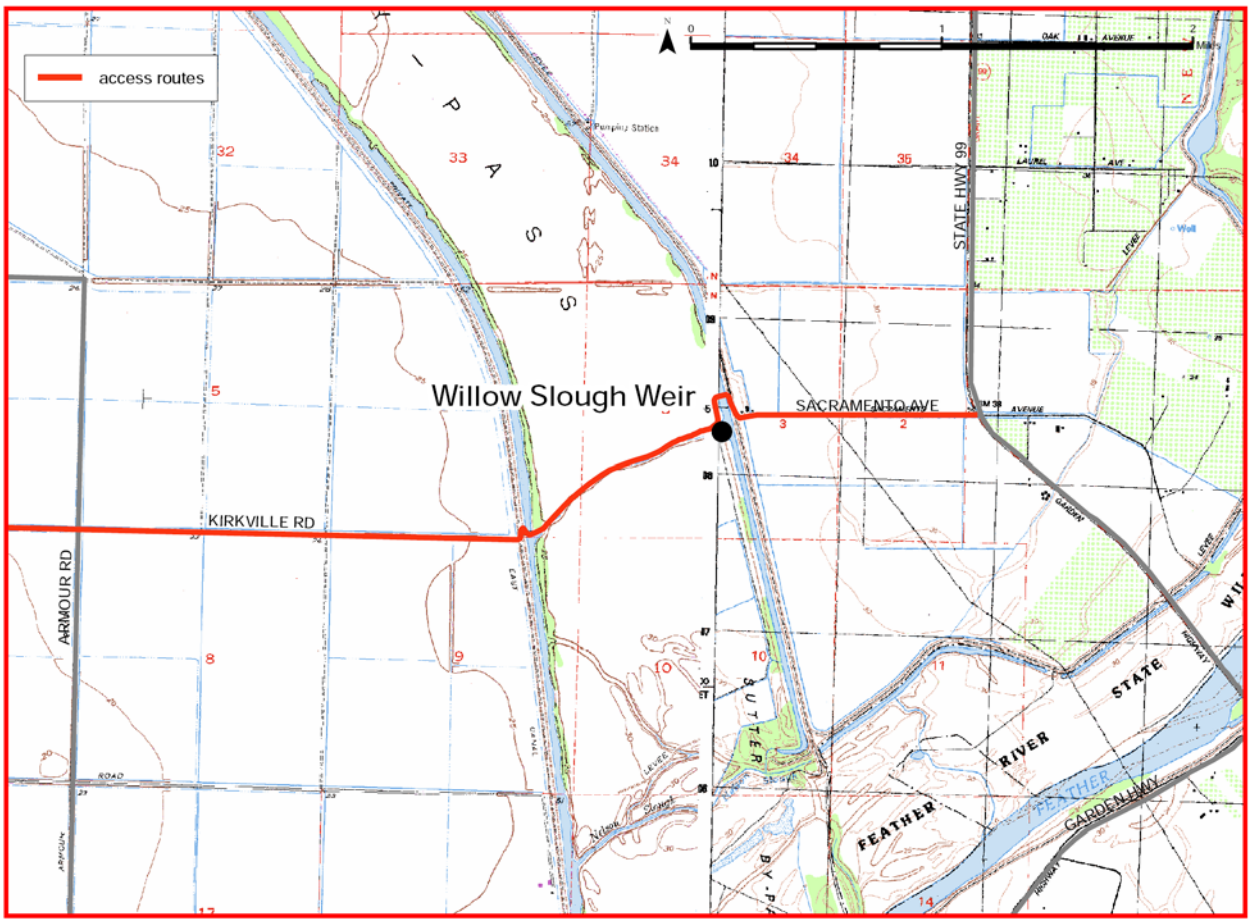


Figure 9. Temporary Fish Passage at Willow Slough Weir

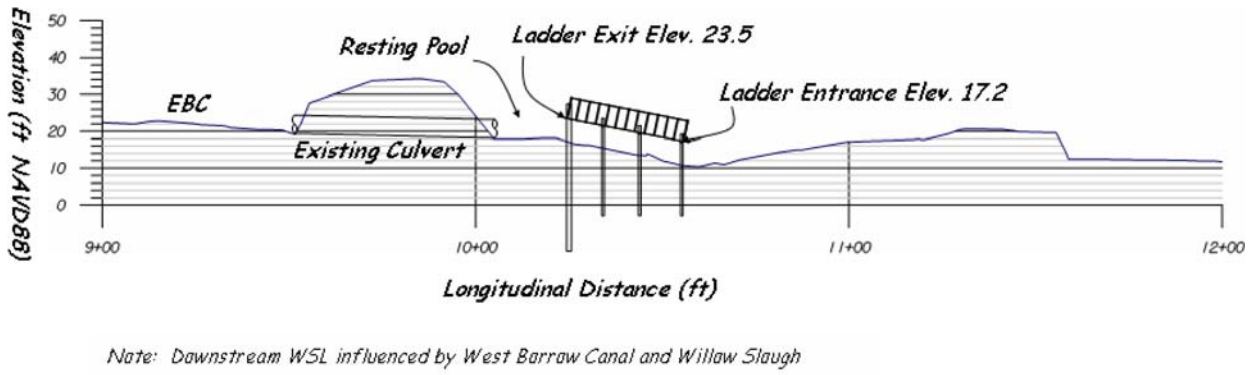
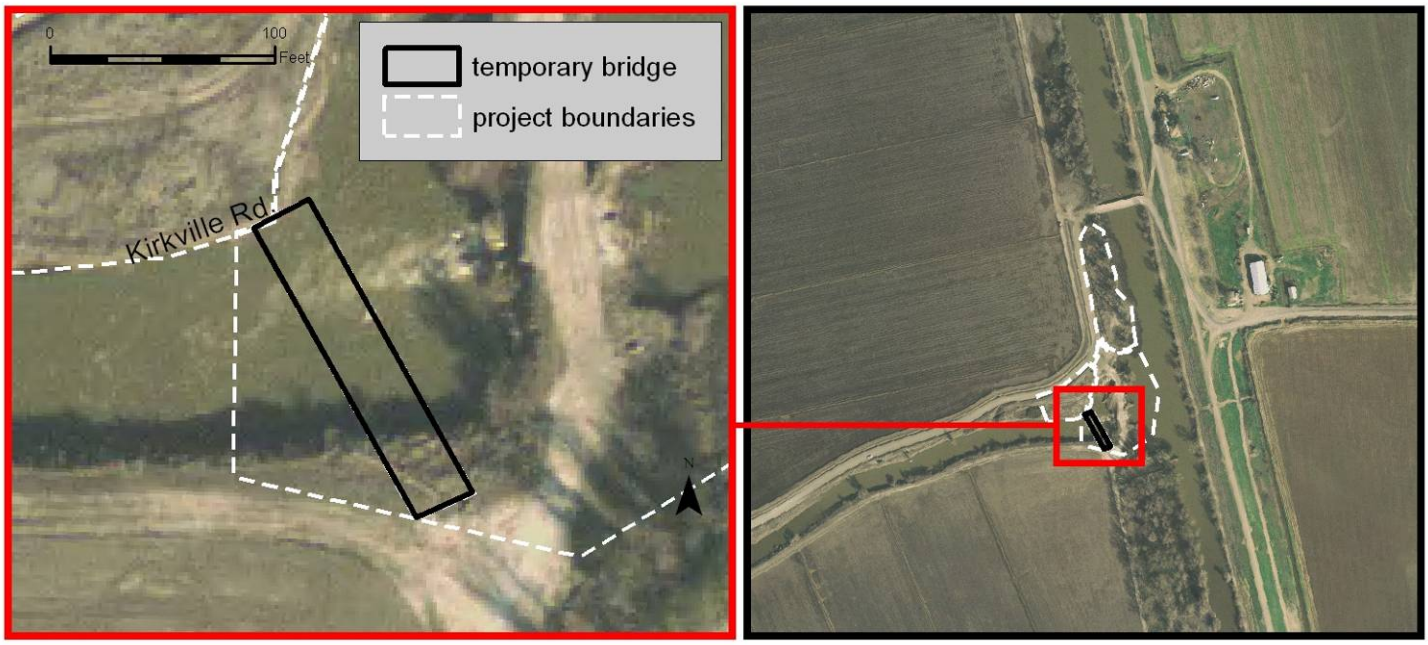


Figure 10. Proposed Temporary Railcar Bridge at Willow Slough



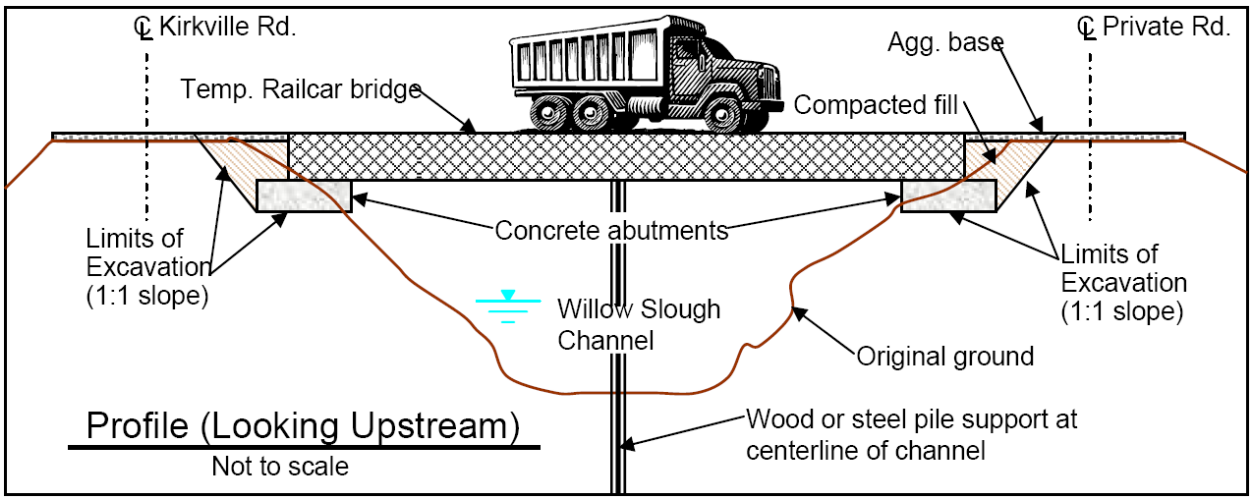
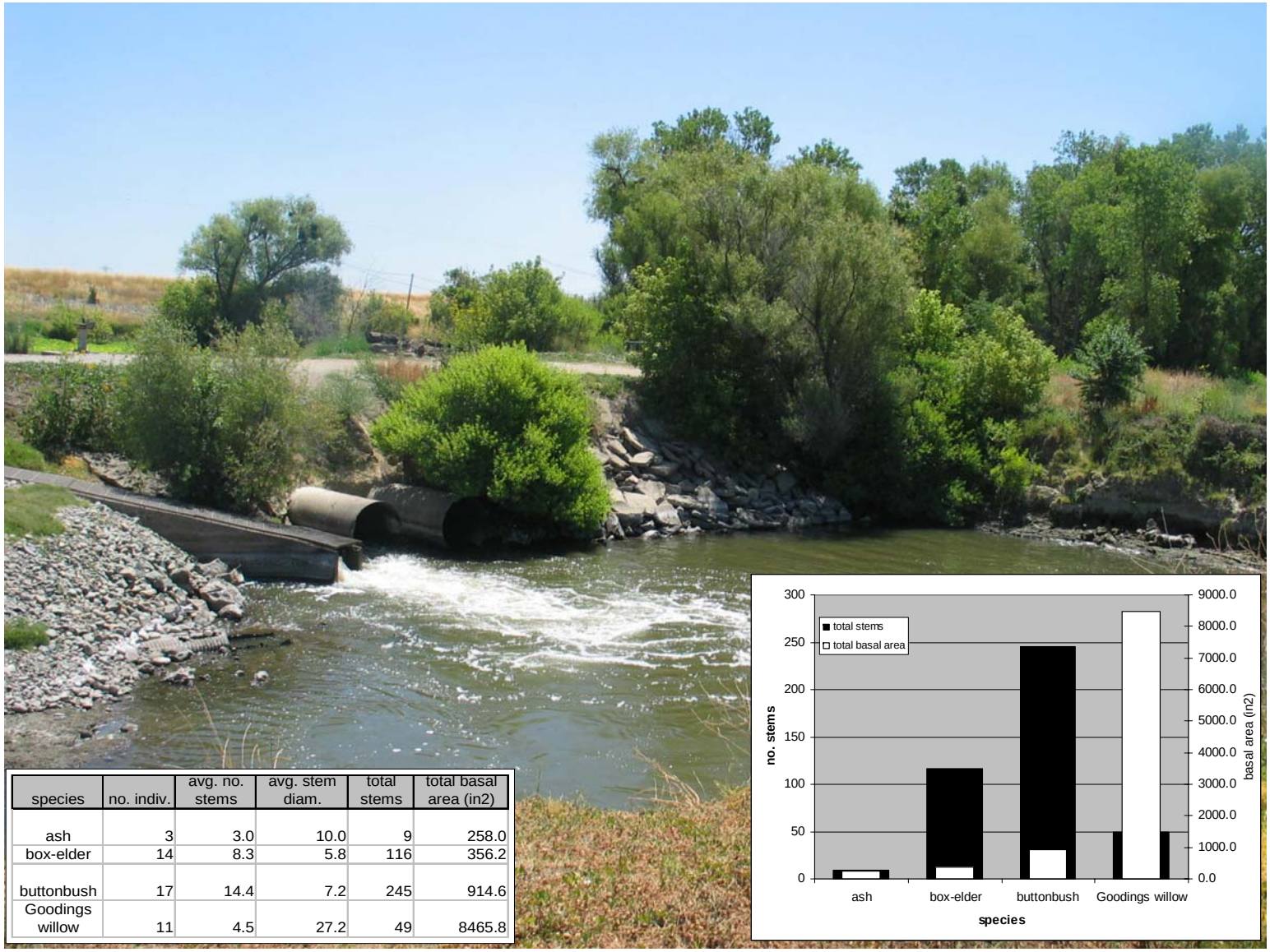


Figure 11. Existing Riparian Vegetation on Downstream side of Willow Slough Weir



species	no. indiv.	avg. no. stems	avg. stem diam.	total stems	total basal area (in2)
ash	3	3.0	10.0	9	258.0
box-elder	14	8.3	5.8	116	356.2
buttonbush	17	14.4	7.2	245	914.6
Goodings willow	11	4.5	27.2	49	8465.8

Figure 12. Vegetation to be Removed during Construction of Weir No. 2

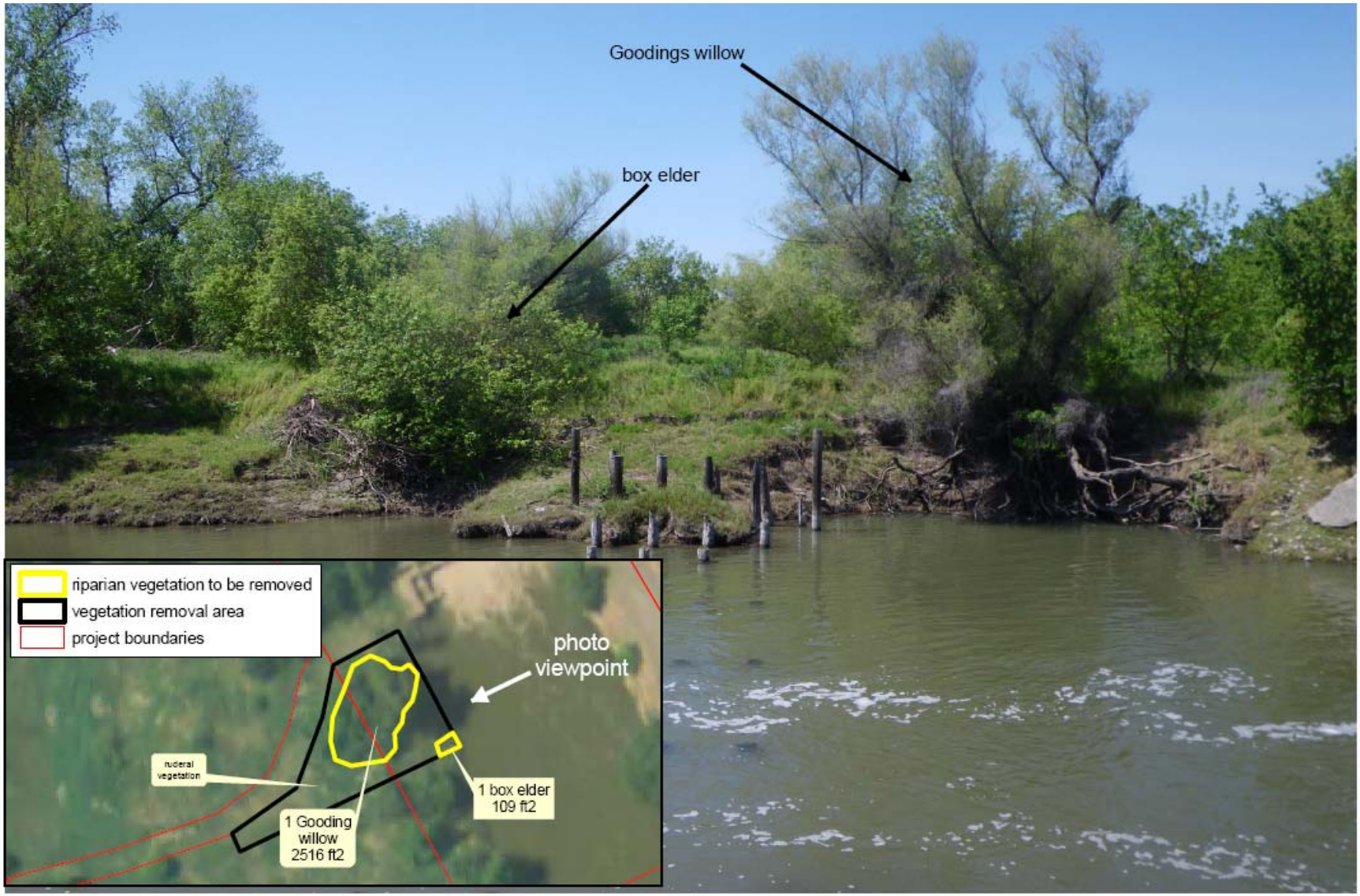


Figure 13. Occurrences of Special-Status Species (CNDDB) in the Weir No. 2 Project Area.

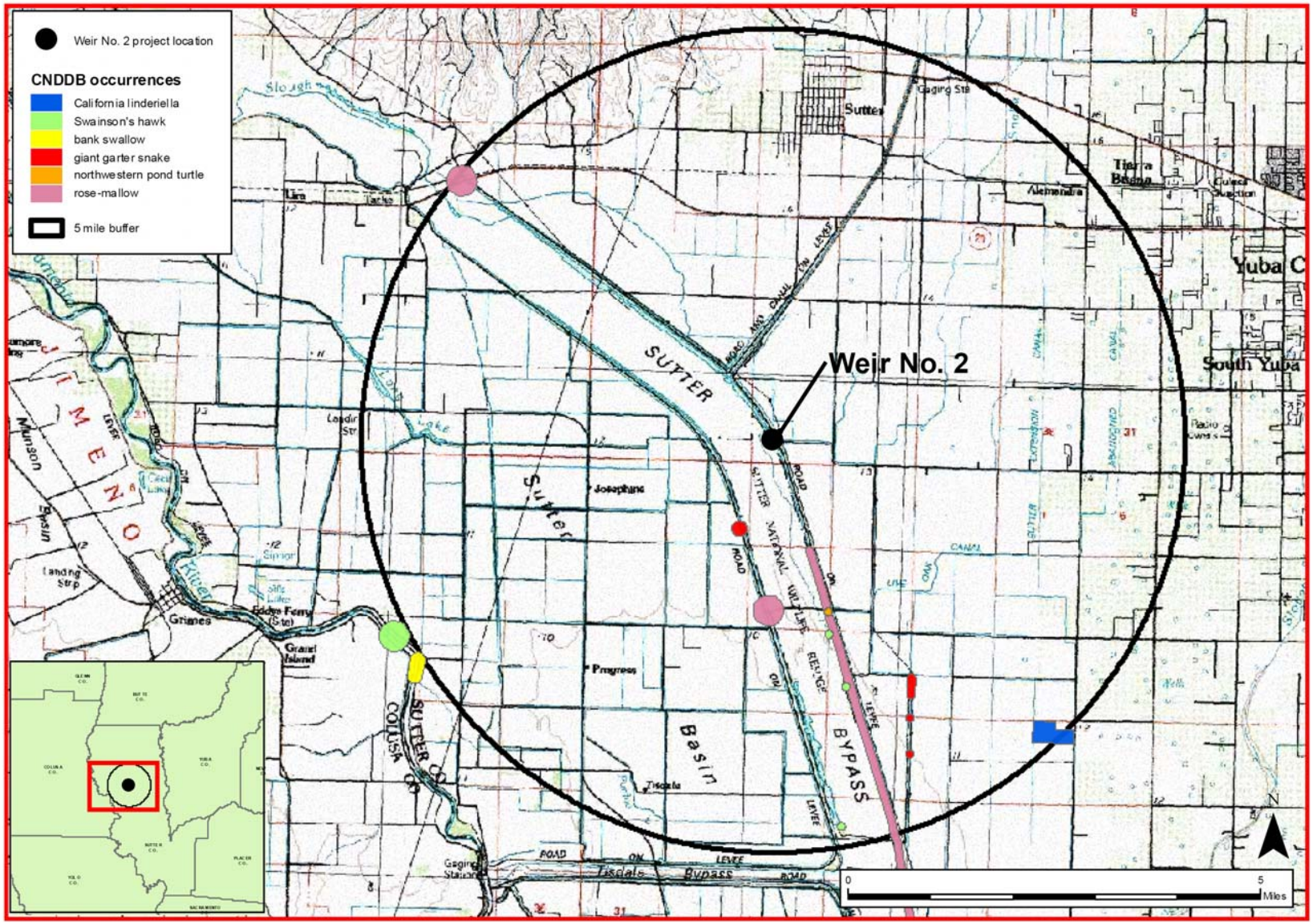
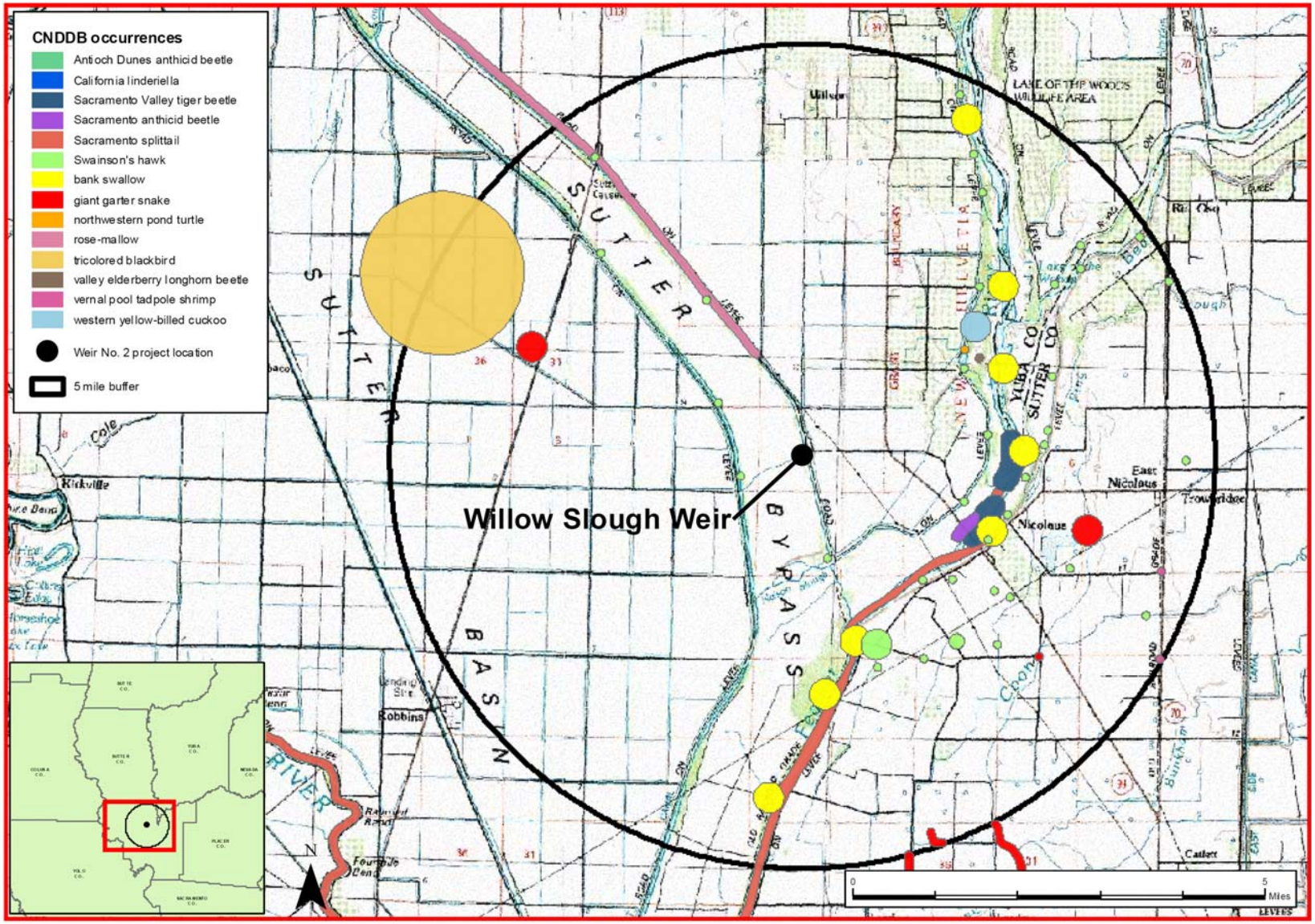


Figure 14. Occurrences of Special-Status Species (CNDDB) in the Willow Slough Weir Project Area.



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 (NWPs). 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. The contractor for the project will file our intention to obtain a general NPDES permit for the construction activities and the contractor will prepare 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” from DFG.

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 24-hour temperature of 75ºF in July, with high temperatures typically above 90 ºF. Winters are generally mild and wet with highs averaging in the mid-40s to low-50s, and 45ºF, respectively.

Greenhouse Gas Emissions (GHG)

When sunlight strikes the Earth's surface, some of it is re-radiated back towards space as infrared radiation (heat). This radiation that would otherwise have escaped back into space is now retained in and warms the Earth's atmosphere. Many gaseous compounds exhibit "greenhouse" properties. Some occur naturally such as water vapor, carbon dioxide, methane, and nitrous oxide while others are anthropogenic (human caused) such as hydrofluorocarbons and perfluorocarbons (also known as fluorinated gases) which are released as byproducts of industrial processes. The majority of greenhouse gas (GHG) emissions come from the combustion of fossil fuels. Carbon dioxide, resulting from the combustion of petroleum, coal, and natural gas, represented 82 percent of total U.S. anthropogenic GHG emissions in 2006 (EIA 2009).

Accumulation of greenhouse gases in the atmosphere has contributed to Global Climate Change. In a document recommending approaches to setting interim significance thresholds for greenhouse gases under the California Environmental Quality Act (CEQA), the California Air Resources Board (CARB) wrote, "Climate change is one of the most serious environmental problems facing the world, the United States, and California today (CARB 2008(a))." The California Climate Change Center projected a temperature rise in California between 3 and 10.5°F by the end of this century (CCCC 2006).

To begin to address the threat of climate change in California, and world-wide, Governor Schwarzenegger signed Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 requires a reduction of greenhouse gas emissions to 1990 levels by 2020 and requires the CARB to implement a Scoping Plan by 2012. The Plan sets forth a list of discrete early actions to begin reducing GHG emissions, assembles an inventory of historic emissions, and establishes GHG emission reporting requirements and the 2020 emissions limits (CARB 2008(b)).

This project has a relatively small area of permanent impact, approximately two acres in total spread over two sites fourteen miles apart. Temporary impacts will occur during construction within the two areas (8 acres total). Heavy construction will take place at both sites for five continuous months in the first year (2010) and at only one site in the second year (2011). In the tables below, GHG emissions produced during the construction of the project and during ongoing operation and maintenance activities are quantified and reported as CO_2 equivalents (CO_2e) in metric tons (MT).

Weir No. 2

Construction Equipment Table:						
Construction Equipment List		Duration (hours)	Fuel Rate (Gal/Hour)	Fuel Type	CO_2e Rate[5] (MT/gal)	CO_2e Produced MT
Concrete Pump Boom		200	10	Diesel	0.0103914	20.8
Concrete Vibrator		212	1	Diesel	0.0103914	2.2
D-9N Dozer		92	10	Diesel	0.0103914	9.6
375L Excavator		116	10	Diesel	0.0103914	12.1
Fork Lift		1028	5	Diesel	0.0103914	53.4
Generators		1772	1	Diesel	0.0103914	18.4
Impact Hammer		448	10	Diesel	0.0103914	46.6
Motor Grader 140H		306	10	Diesel	0.0103914	31.8
Water Truck		406	4	Diesel	0.0103914	16.9
Rough Terrain Crane (20,40,60 ton)[1]		1532	10	Diesel	0.0103914	159.2
Compactor		92	1	Diesel	0.0103914	1.0
Off Highway Trucks		614	2.5	Diesel	0.0103914	16
Water Pump		1800	0.5	Diesel	0.0103914	9.3
Work Boat		48	1	Diesel	0.0103914	0.5
Concrete Finisher		200	1	Diesel	0.0103914	2.1
				Total CO_2e Produced (MT)		399.7

Weir No. 2

Vehicle Trips per Construction Activity:

Construction Activities	No. Vehicle Round Trips	Duration (miles/trip)	Fuel Rate (MPG)	Fuel Type	CO_2e Rate[5] (MT/gal)	CO_2e Produced (MT)
Mobilization and Demobilization	20	10	7	Diesel	0.0103914	0.3
Cofferdam install and removal	70	70	7	Diesel	0.0103914	7.3
Excavation and Fill	224	10	7	Diesel	0.0103914	3.3
Slurry Placement	85	10	7	Diesel	0.0103914	1.3
Materials Delivery (for fish ladder and structures)	120	10	7	Diesel	0.0103914	1.8
Bottom Hinge Gate/Stop Log installation	24	70	7	Diesel	0.0103914	2.5
Grating installation	8	10	7	Diesel	0.0103914	0.1
Control Building	5	10	7	Diesel	0.0103914	0.1
Stone Slope Protection	150	10	7	Diesel	0.0103914	2.2
Existing weir demolition	14	10	7	Diesel	0.0103914	0.2
Personnel Trips[2]	1090	50	20.8	Gasoline	0.0090100	23.6
Pickup Truck[3]	10620	10	10	Gasoline	0.0090100	95.7
			Total CO_2e Produced (MT)			138.4

O&M Operations

Operation and Maintenance - Ongoing Activities	No. of Trips	Duration (miles/trip)	Fuel Rate (MPG)	Fuel Type	CO_2e Rate[5] (MT/gal)	CO_2e Produced (MT)
Weekly Inspections[4]	104	15	17	Gasoline	0.0090100	0.8
Semi-Annual Maintenance - Equipment Travel[4]	4	15	10	Diesel	0.0103910	0.1
Semi-Annual Maintenance - Equipment use	2	8	10	Diesel	0.0103910	0.02
			Total CO_2e Produced (MT)			0.9

Notes:

1. Rough Terrain Crane Duration based on 8 hour usage per day to cover all potential emissions from engine startup and shut down use during the day. Estimate also covers multiple cranes needed for construction.
2. Miles per trip is based on approximately travel distance from Sacramento to Weir No. 2; USEPA 2008 light duty automotive technology and fuel economy.
3. Miles per trip is based on approximately travel distance from Yuba City to Weir No. 2; USEPA 2008 light duty automotive technology and fuel economy
4. Miles per trip is based on approximately travel distance from Sutter Maintenance Yard to Weir No. 2
5. World Resources Institute-Mobile Combustion CO_2 Emissions Calculation Tool. 6-2003 Version 1.2

Willow Slough Weir

Construction Equipment Table:

Construction Equipment List		Duration (hours)	Fuel Rate (Gal/Hour)	Fuel Type	CO_2e Rate[5] (MT/gal)	CO_2e Produced MT
Whacker Compactor		112	1	Diesel	0.0103914	1.2
Concrete Finisher		112	1	Diesel	0.0103914	1.2
Concrete Pump 28' Boom		112	10	Diesel	0.0103914	11.6
D-9N Dozer		216	10	Diesel	0.0103914	22.5
375L Excavator		64	10	Diesel	0.0103914	6.7
Fork Lift, Telescopic (CAT 210)		680	5	Diesel	0.0103914	35.3
Generator Set 10-12KW		1299	1	Diesel	0.0103914	13.5
Work Boat		24	1	Diesel	0.0103914	0.3
Compressor 125 PSI 750 CFM		1458	1	Diesel	0.0103914	15.2
ICE 416L Vibratory Hammer		288	10	Diesel	0.0103914	29.9
Motor Grader 140H		408	10	Diesel	0.0103914	42.4
Off Highway Trucks		288	2.5	Diesel	0.0103914	7.5
Water Truck		472	4	Diesel	0.0103914	19.6
Crane 60 Ton[1]		1051	10	Diesel	0.0103914	109.2
426 Rubber Tire Backhoe		64	10	Diesel	0.0103914	6.7
966G Rubber Tire Loader		88	10	Diesel	0.0103914	9.1
815F Sheepfoot Compactor		328	10	Diesel	0.0103914	34.1
Water Pump		1800	0.5	Diesel	0.0103914	9.4
				Total CO_2e Produced (MT)		375.2

Willow Slough Weir

Vehicle Trips per Construction Activity:

Construction Activities	No. Vehicle Round Trips	Duration (miles/trip)	Fuel Rate (MPG)	Fuel Type	CO_2e Rate[5] (MT/gal)	CO_2e Produced (MT)
Mobilization and Demobilization	40	40	7	Diesel	0.0103914	2.4
Temporary Bridge install and removal	140	22	7	Diesel	0.0103914	4.6
Cofferdam install and removal	36	40	7	Diesel	0.0103914	2.1
Excavation and Fill	3200	10	7	Diesel	0.0103914	47.5
Materials Delivery (for fish ladder structure and culverts)	126	40	7	Diesel	0.0103914	7.5
Temporary fish ladder and Culverts Demolition	24	24	7	Diesel	0.0103914	0.9
Culvert #3 Abandonment	3	40	7	Diesel	0.0103914	0.2
Post Construction Seeding	1	40	7	Diesel	0.0103914	0.1
Personal trips[2]	1090	40	20.8	Gasoline	0.0090100	18.9
Pickup Truck[3]	3720	20	10	Gasoline	0.0090100	67
				Total CO_2e Produced (MT)		151.1

O&M Operations

Operation and Maintenance - Ongoing Activities	No. of Trips	Duration (miles/trip)	Fuel Rate (MPG)	Fuel Type	CO_2e Rate[5] (MT/gal)	CO_2e Produced (MT)
Weekly Inspections[4]	104	24	18	Gasoline	0.0090100	1.3
Semi-Annual Maintenance - Equipment Travel[4]	4	24	10	Diesel	0.0103914	0.1
Semi-Annual Maintenance - Equipment use	2	8	10	Diesel	0.0103914	0.02
				Total CO_2e Produced (MT)		1.4

Notes:

1. Rough Terrain Crane Duration based on 8 hour usage per day to cover all potential emissions from engine startup and shut down use during the day. Estimate also covers multiple cranes needed for construction.
2. Miles per trip is based on approximately travel distance from Sacramento to Willow Slough Weir; USEPA 2008 light duty automotive technology and fuel economy.
3. Miles per trip is based on approximately travel distance from Yuba City to Willow Slough Weir; USEPA 2008 light duty automotive technology and fuel economy
4. Miles per trip is based on approximately travel distance from Sutter Maintenance Yard to Willow Slough Weir
5. World Resources Institute-Mobile Combustion CO_2 Emissions Calculation Tool. 6-2003 Version 1.2

In summary, the replacement of Weir No. 2 will generate approximately 538 MT of GHG during two years of construction (2010 and 2011). Ongoing operation of the weir and fish ladder will generate an estimated 0.9 MT of GHG per year. The Willow Slough Weir Replacement will generate approximately 526 MT GHG during construction in one construction season (May – October 2010). Ongoing operation of the weir and fish ladder will generate an estimated 1.4 MT of GHG per year. The Flood Maintenance Office is continuously examining actions that could reduce future GHG inputs related to our maintenance activities, and these actions will be implemented as feasible.

Construction will result in a temporary increase in GHG production, but the improved operational efficiency of the new weirs will result in a reduction in production of these constituents by reducing the need to operate pumps used to maintain irrigation water supplies. The purpose of the weirs is to raise or lower the water surface elevation in the EBC to accommodate gravity-fed water diversions. Under existing operations, DWR staff may drive from the Sutter Maintenance Yard to Weir 2 several times a day to make manual adjustments at the weir to maintain a constant stage of 38.5 feet USED in the EBC. The adjustments can take several hours to stabilize. It may also be necessary for Sutter Yard staff to drive to Pumping Plant No. 3 to ensure that the water surface elevation has reached the desired stage upstream of Weir No. 2. After the completion of the project, operations at Weir No. 2 will be automated, and vehicle trips to adjust the water surface elevation at the weir could be reduced by as much as 90%. In addition, staff would make fewer trips to Pumping Plant No. 3 to maintain the stage elevation. Replacement of Weir 2 will therefore decrease GHG emissions due to the reduction in vehicle trips associated with operation and maintenance activities. At Willow Slough Weir, DWR staff maintains the water surface elevation upstream of the weir between a stage of 27.5 ft and 29.7 ft (USED). During high flows, water in the EBC may back up behind the weir thereby raising the upstream stage elevation above 29.7 ft. This backwater effect is due to the undersized capacity of the culverts in Willow Slough Weir. As a result, farmers would not able to drain their land to the east of the bypass by gravity diversions and the pumps at Pumping Plant #1 would be turned on to drain the fields, instead. Replacement of Willow Slough Weir would double the capacity of the culverts in the weir and eliminate the need to operate pumps to maintain the upstream stage elevation. Therefore, replacement of Willow Slough Weir will decrease greenhouse gas emissions by reducing pump operations.

Best Management Practices identified in the Air Quality and Transportation sections of this document would also reduce air quality impacts and subsequently reduce GHG production by the construction of these weirs.

The project is consistent with AB 32 goals and Scoping Plan elements by reducing transportation-related greenhouse gases and strengthening the energy efficiency of water management in the East Borrow Canal. The project will have a lower carbon footprint and lower carbon intensive future after completion, due to a reduced need to operate electric pumps and due to the prevention of emergency repairs at Weir No. 2.

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

(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 (CNDDB) 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**
Anthicus antiochensis	Antioch Dunes anthicid beetle	--	Interior sand dunes	No impact	No habitat
Anthicus sacramento	Sacramento anthicid beetle	--	Interior sand dunes	No impact	No habitat
Branchinecta conservatio	Conservancy fairy shrimp	FE	Vernal pools and ephemeral stock ponds.	No impact	No habitat
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	FT	Riparian and oak savanna with elderberry shrubs; elderberries are the host plant.	No impact	No elderberry shrubs present
Branchinecta lynchi	vernal pool fairy shrimp	FT	Vernal pools and ephemeral stock ponds.	No impact	No habitat
Lepidurus packardi	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**
Acipenser medirostris	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.
Onchorhynchus mykiss	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.
Onchorhynchus tshawytscha	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.
Onchorhynchus tshawytscha	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.
Onchorhynchus tshawytscha	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.
Pogonichthys macrolepidotus	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**
Ambystoma californiense	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
Rana aurora draytonii	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**
Actinemys marmorata marmorata	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.
Thamnophis gigas	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**
Accipiter cooperii	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.
Agelaius tricolor	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.
Buteo swainsonii	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.
Circus cyaneus	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.
Coccyzus americanus occidentalis	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.
Elanus leucurus:	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.
Riparia riparia	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**
Hibiscus lasiocarpus	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.
Trichocoronis wrightii var. wrightii	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?	☐	☐	X	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?	☐	☐	X	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	X	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	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 two ~~a~~ small areas of shaded riverine habitat ~~(Figure 10)~~ at Willow Slough Weir (Figure 11) and Weir No. 2 (Figure 12) ~~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 is the replacement of existing structures with new structures of a similar size and function near ~~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?	☐	☐	☐	X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	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?	☐	☐	☐	X

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.

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.

c) No Impact. Water diversions will be maintained throughout construction of the project. 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.

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?	☐	☐	☐	X
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	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)?	☐	☐	☐	X
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	X
e) Create objectionable odors affecting a substantial number of people?	☐	☐	X	☐

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 not be considered significant ~~if~~ because the project will not generate 80 pounds or more of PM_{10} from daily ~~were to be generated daily~~ construction activities.

Construction activities have potential for resulting in localized, short-term construction emissions from stationary, mobile, and area sources. This includes construction equipment, trucks used for hauling, and fugitive dust from earthwork. Construction equipment and haul trucks emit hydrocarbons, nitrogen oxides, sulfur oxides, carbon monoxide, and particulate matter. Fugitive dust is emitted from earthmoving, aggregate stockpiling, and concrete processing. Construction equipment and passenger vehicles could potentially cause short-term construction emissions (for additional details see the Traffic and Transportation section of this document) However, it is not anticipated that the emissions will cause a significant amount of

PM_{10}. Construction-related emissions are further discussed in the Greenhouse Gas Emissions section of this document.

The project's contract specifications require that the contractor must submit and implement an Air Quality Control Plan as well as conduct preventive maintenance, implement dust control measures and use the best available control technology for diesel-fueled construction equipment. Specifically, these best management practices include:

A. The Contractor shall reduce impacts to air quality as much as possible by submitting and implementing an Air Quality Control Plan. The following components, if applicable, shall be included in the plan; and if not applicable, the Contractor shall explain in the plan why that component or portions thereof are not included in the plan. Additionally, the Contractor is required to obtain all necessary approvals and permits from air quality regulatory agencies and they shall be identified in the plan.

B. Preventive maintenance including practicable methods and devices to control, prevent and otherwise minimize emissions or particulate matter. Such measures shall include but not be limited to performing preventive maintenance in accordance with manufacturer's recommendations, mufflers and filters. The Contractor shall maintain engine and emission systems in equipment in proper operating condition. Appropriate maintenance schedules will be defined and implemented for each piece of construction equipment.

C. For diesel-fueled construction equipment include:

    1. Installation of high-pressure injectors.

    2. Use of reformulated diesel fuel.

    3. Use of Caterpillar pre-chamber diesel engines or equivalent.

    4. Substitute electrical equipment.

    5. Substitute Clean Natural Gas (CNG)-powered vehicles.

    6. Substitute gasoline-powered equipment equipped with catalytic converters.

    7. Reduce construction activities during Stage 2 alerts by local Air Pollution Control Districts (APCDs) where required.

D. Fugitive dust shall be minimized by watering, chemical suppressant, minimize areas, cover surfaces, seeding, manage activities or other dust control measures as approved. One or more of the aforementioned control measures shall be used in sufficient quantities to prevent fugitive dust from leaving the work site. Control measures frequency shall be required whenever conditions are dry enough to cause fugitive dust. The Contractor shall control fugitive dust by:

1. Minimizing areas cleared to facilitate construction, such as storage areas, staging areas, stockpile areas and vehicle parking.

2. Constructing roadways, driveways, sidewalks, building pads and other graded surfaces as soon as possible.

3. Performing seeding and other revegetation requirements as specified.

4. Minimizing the amount of construction equipment operating during any given time period. This could include scheduling of construction truck trips to reduce peak emissions, limit the length of the construction workday, and phasing of construction activities.

5. Haul trucks traveling onto or off the work site shall be covered. Haul trucks traveling on the work site will be covered as necessary to prevent dust from leaving the work site.

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?	☐	X	☐	☐
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?	☐	X	☐	☐
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?	☐	☐	X	☐
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?	☐	X	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	X
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?	☐	☐	☐	X

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."

<u>Central Valley Spring-run Chinook Salmon</u>: 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. After the new fish ladder is installed and fully functional, then the existing weir will be removed. 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 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 20~~09~~10 and May 20~~10~~11. 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, an area surrounding

the proposed construction site for the new Weir No. 2 and fish ladder, 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

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; around half of the newly constructed Weir No. 2 and through one culvert in Willow Slough Weir. For additional details see Appendix N.

iv) Pile Driving

Review of the geotechnical studies at the site determined that vibratory pile driving may not be feasible at all times and impact hammering should be allowed, when necessary (original plan specified only vibratory driving).

Impact pile driving at the Willow Slough Weir site may occur: 1) to install sheet piles to provide support for the temporary bridge abutments, 2) to install sheet piles at the center of Willow Slough to provide structural support for the temporary bridge, 3) to install the sheet pile cofferdam to create a backwater pool at the concrete culvert outlet, 4) to construct a cofferdam surrounding the existing fish ladder and culverts at Willow Slough Weir to isolate the construction area, and 5) to construct cofferdams around the concrete culvert to isolate the area for removal or filling of the culvert. At the Weir No. 2 site, impact pile driving may occur: 1) to install a temporary cofferdam to isolate the construction area of the eastern half of the new Weir No. 2) to install permanent sheet piles to form the foundation for the new weir and fish ladder 3) to construct a temporary cofferdam around the western half of the construction area for the new weir, 4) to install permanent sheet piles to retain rip rap placed on the west bank 5) to construct a temporary cofferdam around half of the existing weir, 6) to construct a temporary cofferdam around the remaining half of the existing weir. Impact pile driving has the potential to injure, kill, or alter behavior of fish.

Most pile driving will occur during the month of May in 2010 or 2011. The month of May coincides with the tail end of the Spring-Run Chinook adult migration and the Juvenile Chinook out-migration for Spring-run and Fall / Late-fall Run. Pile driving could potentially delay adult spring-run during upstream migration or delay juvenile fall-run and spring-run during their out migration, but the majority of the Spring-run adult population is expected to be upstream of the East Borrow Canal in Butte Creek at that time. At the Weir No. 2 site, there is also potential to delay Fall-run Chinook during the

upstream migration in October 2011, but pile driving is expected to last only 5 days in October.

DWR will abide by the requirements of the Biological Opinion for the project, which will be issued by the National Marine Fisheries Service. During construction, biological monitors will be onsite at areas where pile driving occurs and will notify DFG and NMFS if sensitive species are harmed by construction impacts. Impacts due to impact pile driving will also be minimized by requiring that the Contractor implement best management practices, such as those described in the Caltrans Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish (2009) or other measures.

v) Vegetation Removal and Restoration

At the Weir No. 2 site, approximately 0.28 acre of riparian vegetation will be cleared on the west bank to provide access to the new weir construction site and to create a new access road. The new location of Weir No. 2 will eliminate approximately 2,500 sq. feet of Shaded Aquatic Riverine (SAV) habitat for listed salmon, eliminate woody riparian wildlife habitat, and possibly increase the potential for shoreline erosion. Included in the removal is a Goodings willow tree on the West Bank of the EBC with an exposed rootwad that could potentially provide good rearing habitat for juvenile salmonids (Figure 12). Replacement of Willow Slough Weir will also require the removal of 0.02 acre (1000 square ft) of SAV habitat and riparian vegetation, including Goodings willow, buttonbush, box elder, and ash (Figure 11). DWR will replant riparian vegetation at >1:1 and restablish SAV. The EBC is densely vegetated with many miles of riparian habitat. Because the SAV will be replaced and the loss of this additional amount of SRA habitat is relatively small, it is anticipated the temporary removal of vegetation will not significantly impact listed species.

vi) 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 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 U.S. 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 13), 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 CNDDB (Figure 13), 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 CNDDB (Figure 14), 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 CNDDB 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~~ Two small areas of riparian vegetation will be removed during removal and replacement of Willow Slough Weir (Figure 11) and Weir No. 2 (Figure 12). 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~~ eleven 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?	☐	☐	☐	X
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to '15064.5?	☐	X	☐	~~X~~ ☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	X
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	X	☐	~~X~~ ☐

ENVIRONMENTAL SETTING

ARCHAEOLOGICAL CONTEXT

Limited archaeological data related to the northern Sacramento Valley necessitates that a reconstruction of the prehistory rely on studies that have taken place to the south of, and in the vicinity of, Sacramento. Despite implications of Central California habitation dating back 10,000 years, evidence supports occupation of the Sacramento Valley only to about 3,500 years ago. This apparent lack of evidence is likely the result of the frequent flooding the valley endures and the resulting sedimentation (Elsasser 1978; Moratto 2004; Wallace 1978).

During the 1930s, Sacramento Junior College, in conjunction with the University of California, Berkeley, was the first to begin systematic investigations of Sacramento Valley archaeological sites. Included in these early investigations were several sites along the Cosumnes River in the northern Sacramento–San Joaquin Delta and Colusa County. As the result of those efforts and subsequent studies in the region, three cultural horizons were delineated: the Early, the Middle, and the Late, with respective initial dates of 2,500 B.C., 1,500 B.C., and 500 A.D. (Elsasser 1978).

Subsequent research has yielded a refinement of dates along with the realization that basic socioeconomic and technical trends or patterns occurred over a broad region. It has also been determined that these patterns could last for different lengths of time in localized areas and that they were distinguished by unique expressions of material culture. The revised cultural chronology is currently identified by the Windmiller Pattern, the Berkeley Pattern, and the Augustine Pattern (Moratto 2004).

The Windmiller Pattern predominated the region from approximately 2,000 B.C. to 500 B.C. Relative to subsequent periods, Windmiller subsistence appears to have focused largely on hunting, as evidenced by large quantities of faunal remains and projectile points in the archaeological record. However, fishing and seed procurement are also evident. With regard to tool technology, both flaked-stone and ground-stone industries are well represented. A vast trade network facilitated the acquisition of materials for tool and ornament production, where obsidian was obtained from North Coast Range and eastern Sierran sources, shell beads from the coast, and quartz and alabaster from the Sierra foothills. The Windmiller Pattern is also characterized by distinctive burial patterns, with bodies typically buried fully extended, face down, with the head oriented toward the west, and the placement of funerary objects (Moratto 2004; Wallace 1978).

The Berkeley Pattern was present in the Central Valley from approximately 500 B.C. to 500 A.D. This pattern is represented by an apparent increase in the use of pestles and mortars, indicative of an intensified reliance on acorns as a principal dietary staple. In addition, the Berkeley Pattern exemplifies a well-developed bone industry, distinctive diagonal flaking of large concave-base points, and marked forms of shell beads and ornaments. In contrast to the Windmiller Pattern, Berkeley burials are found in a flexed position with variable orientation and fewer funerary artifacts (Moratto 2004).

The Augustine Pattern occurred in the Central Valley from approximately A.D. 500 to contact with non-indigenous peoples. This pattern is distinguished by large populations with complex social systems that depended heavily on fishing, hunting, and gathering. Tool technology is represented by shaped pestles and mortars, bone awls, the bow and arrow, and in some cases pottery. There was considerable variation in mortuary practices, including flexed burials, cremation, and funerary object differentiation (Moratto 2004).

ETHNOGRAPHIC CONTEXT

The project area is located in an area traditionally inhabited by the Nisenan, or Southern Maidu, the southernmost linguistic group of the Maidu tribe. Nisenan territory was marked by the Sacramento River to the west, the crest of the Sierra Nevada to the east, and the American River to the south. Due to language similarities with neighboring groups, the northern boundary has yet to be clearly established; however, it appears that the boundary between the Nisenan and the Konkow Maidu to the north is in the vicinity of Honcut Creek. Given such geographic range, the Nisenan occupied lands from near sea level in the Sacramento Valley up to 10,000-foot peaks in the Sierra Nevada (Wilson and Towne 1978).

Nisenan groupings ranged from small extended families of 15 to 25 people, to large villages of several families containing over 500 individuals. Each village or group of villages controlled its territory, which included hunting and fishing grounds. A headman, or captain, acted as advisor to the group; however, each family had its leader who assisted the village headman. Nisenan religion was centered in the Kuksu cult system, which was typical through much of north-central California. (Wilson and Towne 1978).

Based on dialect, the Nisenan were further divided into three separate groups; the Northern Hill, the Southern Hill, and the Valley; this latter group occupied the current project location. Valley Nisenan built their villages on low, natural rises along streams and rivers, or on gentle slopes

with southern exposure. The closest ethnographic village identified near the proposed project area is that of the Olash, which is located just east of Willow Slough Weir along the Feather River. Weir No. 2 is located in an unclaimed area with no ethnographic villages in close proximity (Kroeber 1925, 1932; Wilson and Towne 1978).

HISTORIC CONTEXT

The first report of Europeans venturing into the project area was the 1820–1821 expedition led by Luis Arguello that included portions of the Feather River. Arguello reportedly assigned the river its present name, Rio de las Plumas. A series of trapping parties up the Sacramento Valley followed in the late 1820s and 1830s, including that of Jedediah Smith and various Hudson's Bay Company associates. It was during this time that one of these parties transmitted a lethal disease to the Native American population, causing the demise of up to 75 percent of the indigenous population. Thus, when the Mexican government began granting tracts of land to loyal Californios in the early 1840s, large portions of northern California appeared to be largely unpopulated. Gold was discovered shortly thereafter in 1848, which led to the Gold Rush and the vast migration of peoples to the foothills of the Sierra Nevada Mountains of California. This onslaught brought further decimation to the indigenous populations and severely degraded the natural landscape of the region (Selverston et al. 2005).

The area now known as Sutter County was visited by members of various Spanish expeditions in 1841, who were in search of mission sites. Shortly thereafter, in 1842, the majority of the area was deeded by the Mexican Government to John Sutter, after whom the county was named. In the same year, Sutter established John Sutter's Hock Farm, which was the first large-scale agricultural settlement in Northern California, composed of grain, cattle, orchards and vineyards. Sutter County was incorporated by the California State Legislature as one of the state's original 27 counties on February 18, 1850. At that time it included the southwest portion of what is now Placer County and a piece of what now belongs to Colusa County. Boundaries were fixed in their present locations in approximately 1856 (Sutter County History 2009).

Although the general region was prone to flooding and often inundated, agriculture was, and continues to be, the primary economic base for the area. The ability to successfully grow crops in the rich soil was greatly enhanced in 1913 when Reclamation District 1500 was created and the construction of levees, weirs, and bypasses began in the area. Much of the impetus for flood control was a result of the efforts of the California Debris Commission, which was established by Congress in 1893 to deal with sedimentation resulting from hydraulic mining. In 1910, the State developed a comprehensive flood control plan to improve navigation and flood management on the state's rivers (California Department of Transportation 2006). The United States Congress authorized the Sacramento River Flood Control Project in 1917, and construction began in 1918. The Sutter Bypass and East Borrow Canal, as part of the SRFCP, were built in the early 1920s.

Today, over 93 percent of Sutter County's land has been deemed "important farmland", making it one of the most intensively farmed counties in California. As such, important developments in agricultural products were made, including: the development of "Proper Wheat" by Edward Proper in 1868, known for its suitability for shipping over long distances; the "Thompson Seedless" grape developed in 1873 by William Thompson, which revolutionized the raisin industry; and the Canning Cling Peach developed in the 1880s (California Department of

Transportation 2006). As farming endures, the project area continues to reflect the early rural beginnings of the historic era in the county.

PALEONTOLOGICAL CONTEXT

The project site is located in the Sacramento Valley portion of the Great Valley Geologic Province of California (Great Valley Province), located between the Sierra Nevada Mountains to the east and the Coast Range Mountains to the west. Most of the surface of the Great Valley Province is covered with Recent (Holocene, or 10,000 years before present [B.P.] to present day) and Pleistocene (10,000–1,800,000 years B.P.) alluvium. This alluvium is composed of sediments from the Sierra Nevada to the east and the Coast Range to the west that were carried by water and deposited on the valley floor. Siltstone, claystone, and sandstone are the primary types of sedimentary deposits.

DESCRIPTION OF FIELD WORK

Field work in support of the current project was conducted on May 02, 2007 and July 23, 2009.

The May 02, 2007 field inventory surveyed all project components within the Area of Potential Effects (APE) of the proposed undertaking, as defined at that time (Schmid 2008). A systematic pedestrian survey was conducted in five-meter transects at both the Willow Slough Weir and Weir No. 2 project locations. Due to dense seasonal grasses and forbs, surface visibility was poor at Willow Slough Weir, except where access roads had been maintained and mowed. Conversely, surface visibility was good to excellent at Weir No. 2, as land within the APE had recently been mowed.

The July 23, 2009 survey inventoried the revised project boundaries (Schmid 2009). This included the area just downstream of Weir No. 2, and additional lands on the east and west banks of the East Borrow Canal, adjacent Weir No. 2. Five-meter pedestrian transects were used to survey the new project components. Ground visibility varied from poor to excellent. Ground visibility at the location of the new weir was poor along the east side of the canal, because this section was covered in rip rap. Surface visibility on the west side of the canal was excellent, as this section of the canal has endured significant erosion and had minimal vegetation. Along the new section of access road, visibility was poor. The vegetation at this location was very dense with seasonal grasses and thistle; however, some insight into the ground surface below was obtained as a result of an animal trail that ran down the alignment of the new access road. Visibility at the new location of the control building was excellent, as it is located on top of the levee, which was devoid of vegetation.

Four cultural resources were identified during the course of the field studies: the East Borrow Canal (including the levees), Weir No. 2, Willow Slough Weir, the wood piling remains of bridge number EL-5.

NATIVE AMERICAN CONSULTATION

The Native American Heritage Commission (NAHC) was contacted on February 27, 2007, regarding the potential for sacred lands within the project area. The NAHC conducted a search

of the Sacred Lands File on March 30, 2007, and reported that no Native American sacred sites are known to exist within the project area.

The NAHC provided a list of local Native American representatives who could be contacted regarding their possible knowledge of resources within the project area. On April 09, 2007, letters of inquiry were sent to the Enterprise Rancheria of Maidu Indians and the Strawberry Valley Rancheria, requesting any information they might have on the project area. To date, no response has been received from those contacted.

CULTURAL RESOURCES LOCATED ON THE PROJECT SITE

A records search was conducted for the APE by the staff of the Northeast Information Center of the California Historical Resources Information System, California State University, Chico on March 22, 2007. The search encompassed a 0.5 mile radius around the project area. The search indicated that no archaeological sites or historical resources have previously been documented within the project boundaries. One previous archaeological survey was conducted immediately adjacent to Weir No. 2 and appears to overlap some of the project area; however, no cultural resources were identified in the course of that study.

Cultural resources observed within the project's APE include: the East Borrow Canal of the Sutter Bypass, Weir No. 2, Willow Slough Weir, and the wood piling remains of bridge EL-5.

The East Borrow Canal was constructed in 1924 as part of the Sacramento River Flood Control Project (SRFCP); soil from the canal was used for building the east levee of the Sutter Bypass. Flows in the canal start from Butte Slough, and are composed primarily of natural Butte Creek flows and irrigation return flows from the Butte Sink and Butte Basin. The East Borrow Canal functions as an irrigation water supply and drainage canal in addition to channeling natural water flows. The overall length of the canal is about 22 miles; it is around 150 feet wide.

Weir No. 2 was originally an earthen dam that was replaced in 1925 by a timber flashboard dam after being washed out by floods. In 1946, the timber flashboard dam was superseded by a concrete structure built on the same foundation. The existing weir has and approximately 4-inch-thick slab foundation with cutoff walls at the upstream and downstream ends. There are 11 concrete piers that are each about 9 inches thick, 14.5 feet long, and 13 feet high. Twelve bays, about 6 feet wide with flashboards, control the water upstream of the weir. A pool and weir fish ladder exists at the right abutment of Weir No. 2.

Willow Slough Weir is an earthen dam with two 60-inch diameter corrugated metal pipe culverts and on 60-inch diameter reinforced concrete culvert with slide gates that control flow from the lower end of the East Borrow Canal into Willow Slough. The structure was built between 1924 and 1925. A Denil fish ladder was constructed through the weir in the 1980s.

The piling remains of bridge EL-5 consist of 35 round wood supports within the East Borrow Canal, just downstream of Weir No. 2. The wood bridge structure was built in the 1940s as a northerly access to the Sutter National Wildlife Refuge in the Sutter Bypass. The bridge was washed out during a flood event in January 1973.

The East Borrow Canal, Weir No. 2, and Willow Slough Weir are all contributors to the SRFCP, which is potentially eligible for the National Register of Historic Places and the California Register of Historical Resources as a historic district. Weir No. 2 and Willow Slough Weir,

however, are not individually eligible for the NRHP/CRHR because they no longer have integrity of their original design due to significant modifications and deterioration over the years; nor were they ever architecturally significant (Komas 2008). Furthermore, their upgrade and replacement would not modify the practices and the function of the East Borrow Canal and the SRFCP; therefore, there would not be a substantial adverse change to these resources.

The bridge remains retain no integrity and, therefore, that resource a not eligible for the NRHP or the CRHR.

PALEONTOLOGICAL RESOURCES LOCATED ON THE PROJECT SITE

Sediments adjacent to the Sacramento River in the project area are composed primarily of recent (Holocene) (10,000 years B.P. and younger) alluvial channel and basin deposits (Wagner et al. 1987). These deposits consist primarily of unconsolidated sand and silt. Holocene alluvial deposits overlie an older alluvial fan system composed of Pleistocene-age sediments. By definition, to be considered a fossil, an object must be more than 10,000 years old; therefore, parts of the project site mapped in Holocene deposits are not considered sensitive for the presence of paleontological resources.

DISCUSSION

a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

No Impact. As discussed above, the weirs, while contributors to the potential SRFCP historic district, are not individually significant resources. Similarly the wood piling remains of bridge EL-5 are not a significant resource. The modification of Willow Slough Weir and the removal of Weir No. 2 and the wood pilings would not have a substantial change to the SRFCP. Furthermore, cultural resources investigations conducted by DWR did not result in the discovery of cultural resources within the project staging areas. Therefore, there would be no impact on cultural resources.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Less Than Significant with Mitigation Incorporated. While archaeological investigations have not located archaeological resources in the project vicinity or on the project site or staging areas, unique archaeological resources or historical resources could be discovered and damaged during project implementation. Because of the possibility for the discovery and damage of these resources, this impact is potentially significant. Implementation of Mitigation Measure CULT-1 would reduce this impact to a less-than-significant level.

Mitigation Measure CULT-1: Immediately Halt Construction if Cultural Resources are Discovered.

Should any cultural resources, such as structural features, unusual amounts of bone or shell, artifacts, human remains, or architectural remains, be encountered during any construction activities, work shall be suspended immediately at the location of the find and within an appropriate radius. A qualified DWR archaeologist will conduct a field investigation of the

specific site and recommend mitigation deemed necessary for the protection or recovery of any cultural resource concluded by the archaeologist to represent historical resources or unique archaeological resources. DWR shall be responsible for approval of recommended mitigation if it is determined feasible in light of approved land uses, and shall implement the approved mitigation before resuming construction activities at the archaeological site. Discoveries of human remains shall be treated as described below for Mitigation Measure CULT-2.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

No Impact. Sediments on the project site are Holocene-age alluvium, which by definition are too young to contain paleontologically sensitive resources. Therefore, construction activities would not have an impact on paleontological resources.

d) Disturb any human remains, including those interred outside of formal cemeteries?

Less Than Significant with Mitigation Incorporated. While evidence for the presence of human remains has not been identified within the project APE, the potential exists for human remains to be encountered and disturbed during ground-disturbing activities associated with project implementation. This would be a potentially significant impact. Implementation of Mitigation Measure CULT-2 would reduce this impact to a less-than-significant level.

Mitigation Measure CULT-2: Immediately Halt Construction if Human Remains are Discovered.

In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, the contractor or DWR shall immediately halt potentially damaging excavation in the area of the burial and notify the Sutter County Coroner, and a DWR in-house archaeologist/cultural resource specialist to determine the nature of the remains. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the NAHC by phone within 24 hours of making that determination (Health and Safety Code Section 7050[c]). The Most Likely Descendant (MLD) designated by the NAHC shall determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed as provided for in California Public Resources Code (PRC) Section 5097.98, in consultation with DWR and the landowner, subject to the limitations provided in Section 5097.98. Adherence to these procedures and other provisions of the California Health and Safety Code and PRC will reduce potential impacts on human remains to a less-than-significant level.

~~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 Komas, 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:	☐	☐	☐	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.	☐	☐	☐	X
ii) Strong seismic ground shaking?	☐	☐	☐	X
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	X
iv) Landslides?	☐	☐	☐	X
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	X	☐
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?	☐	☐	☐	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?	☐	☐	☐	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?	☐	☐	☐	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 15).

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.

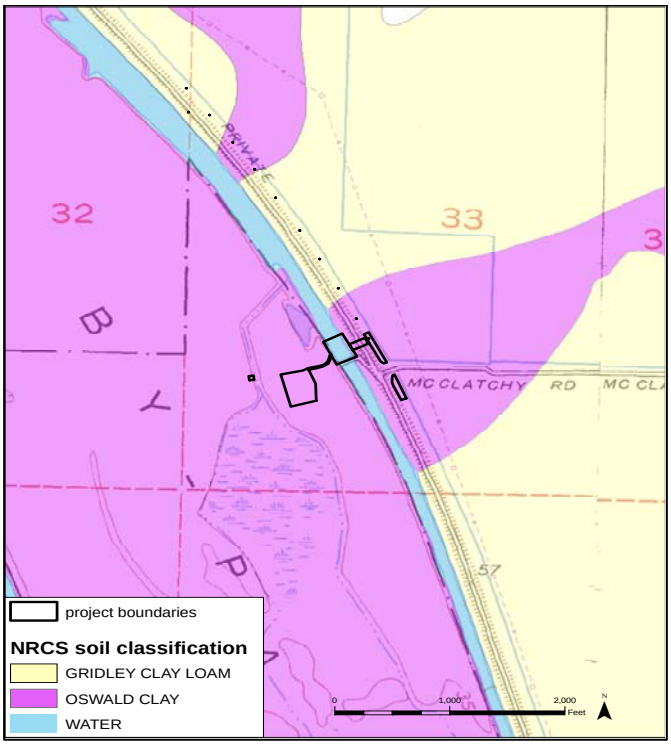
c) No impact. The geology and soils at the project site will not become unstable as a result of the project.

d) No impact. The project is not located on expansive soils.

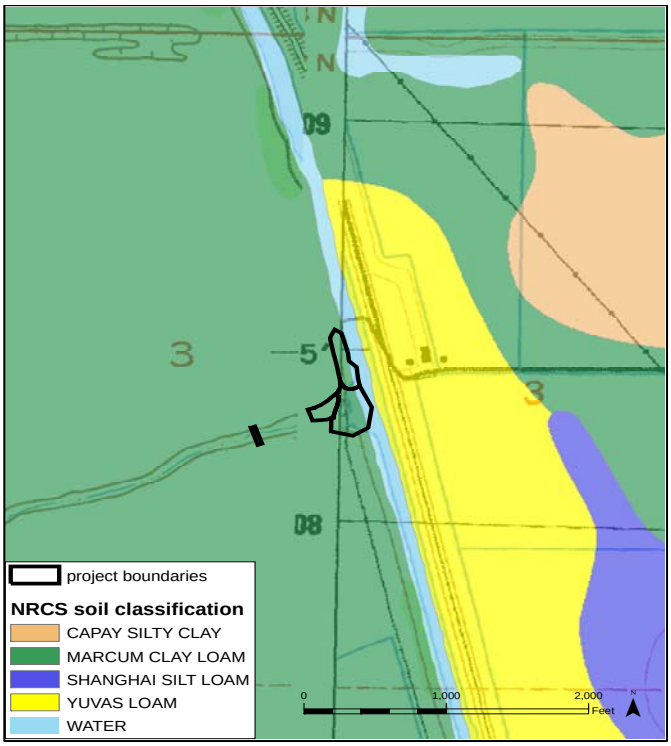
e) No impact. The project does not involve septic tanks or wastewater disposal.

Figure 15. Soils of the Project Area

a. Weir No. 2



b. Willow Slough Weir



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?	☐	☐	☐	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?	☐	☐	X	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	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?	☐	☐	☐	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?	☐	☐	☐	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?	☐	☐	☐	X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	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?	☐	☐	☐	X

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?	☐	☐	X	☐
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)?	☐	☐	☐	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?	☐	☐	X	☐
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?	☐	☐	X	☐
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?	☐	☐	X	☐
f) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or	☐	☐	☐	X

provide substantial additional sources of polluted runoff?				
g) Otherwise substantially degrade water quality?	☐	☐	☐	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?	☐	☐	☐	X
i) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	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?	☐	☐	☐	X
k) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	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).

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

2. 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.

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

4. 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.

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

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

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

8. 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.

9. 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. 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. 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 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 during construction, but will be removed upon completion of each phase (before October 1). ~~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?	☐	☐	☐	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?	☐	☐	☐	X
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	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?	☐	☐	☐	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?	☐	☐	☐	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?	☐	☐	X	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	X	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	X
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	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 expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	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?	☐	☐	☐	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)?	☐	☐	☐	X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	X

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

a) No impact. This project will replace existing weirs that serve existing irrigation diversions, 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)?	☐	☐	☐	X
b) Police: Will the project require additional staff or equipment to maintain acceptable service ratios, response times or other performance objectives?	☐	☐	☐	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?	☐	☐	☐	X
d) Other public facilities?	☐	☐	☐	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?	☐	☐	☐	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?	☐	☐	☐	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)?	☐	☐	X	☐
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	X	☐
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?	☐	☐	☐	X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	X	☐
e) Result in inadequate emergency access?	☐	☐	☐	X
f) Result in inadequate parking capacity?	☐	☐	☐	X
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	X

Several state highways and local roads provide access to the project sites at Weir No. 2 and Willow Slough Weir. Impacts to air quality caused by vehicle trips are addressed in the Greenhouse Gas Emissions and Air Quality sections of this document.

Heavy equipment will use the routes shown in Figure 8 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 10) will be installed to provide access across Willow Slough to an adjacent landowner, as

described in Appendix N. 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

Construction Activities	No. Vehicle Round Trips
Mobilization and Demobilization	40
Temporary Bridge install and removal	140
Cofferdam install and removal	36
Excavation and Fill	3200
Materials Delivery (for fish ladder structure and culverts)	126
Temporary fish ladder and Culverts Demolition	24
Culvert #3 Abandonment	3
Post Construction Seeding	1
Personal trips	1090
Pickup truck	3720

~~Activity~~	~~Truck Round Trips~~
~~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) (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 6) 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 location of the new Weir No. 2 structure will also require construction of a small access road to the site (Figure 5). The road improvement and realignment of the access road are described in the "Projects Components" section of this document. 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

Construction Activities	No. Vehicle Round Trips
Mobilization and Demobilization	20
Cofferdam install and removal	70
Excavation and Fill	224
Slurry Placement	85
Materials Delivery (for fish ladder and structures)	120
Bottom Hinge Gate/Stop Log installation	24
Grating installation	8
Control Building	5
Stone Slope Protection	150
Existing weir demolition	14
Personnel Trips	1090
Pickup Truck	10620

~~Activity~~	~~Truck Round Trips~~
~~Mobilization and Demobilization~~	~~20~~
~~General Excavation and Fill~~	~~600~~
~~Cofferdam Installation~~	~~635~~
~~Fish Ladder Structure~~	~~50~~
~~Weir Replacement~~	~~67~~
~~Riprap~~	~~150~~
~~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 following best management practices have been included in the contractor's specifications to minimize traffic-related impacts:

Vehicles and equipment use shall be restricted to existing roads to the maximum extent possible. Off-road work areas shall be inspected and approved by a DWR Environmental Scientist prior to

use. No off-road driving or parking shall be allowed in areas not previously approved by a DWR Environmental Scientist.
Construction-related vehicles shall not exceed 20 mph on straight and level roads, with a 10 mph speed limit in areas of steepness or with curves.

The following components, if applicable, shall be included in the Traffic and Noise Abatement Plan; and if not applicable, the Contractor shall explain in the plan why that component or a portion thereof is not included in the plan.

1. Impacts of construction may affect road use by local landowners, the public, and/or local agencies or utilities companies, where-ever normal traffic must be detoured. The Contractor shall prepare a traffic plan in consultation with the Engineer, and State of California and Sutter County transportation agencies, as needed. Contractor shall secure all necessary traffic control permits from those agencies and identify them in the plan.

2. Mitigation: The Contractor shall minimize traffic impacts as much as possible as follows:

    a. Measures to minimize traffic impacts where construction crosses public roads and highways. Contractor will not block roads, gates, or parking areas with project vehicles except with prior permission in writing from the Engineer. Parking shall be made available at staging areas for trucks and heavy equipment.

    b. The traffic plan should provide a ride share program. Employees should be encouraged to participate in the program and shall be provided incentives.

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?	☐	☐	☐	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?	☐	☐	☐	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?	☐	☐	☐	X
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	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?	☐	☐	☐	X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	X
g) Comply with federal, State, and local statutes and regulations related to solid waste?	☐	☐	☐	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?	☐	X	☐	☐
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)?	☐	☐	X	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	X	☐

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 and Weir No. 2 projects include~~s~~ 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, 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. 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
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

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