



# **Fremont Weir**

## **Adult Fish Passage Modification Project**

*REVISED INITIAL STUDY/  
ENVIRONMENTAL ASSESSMENT*



May 2017





## Project Information

<b>1. Project Title</b>	Fremont Weir Adult Fish Passage Modification Project
<b>2. Lead Agency Name and Address</b>	<p>California Department of Water Resources          Division of Environmental Services          3500 Industrial Blvd.          West Sacramento, CA 95691</p> <p>U.S. Bureau of Reclamation          Bay-Delta Office          801 I Street, Suite 140          Sacramento, CA 95814</p>
<b>3. Contact Person and Phone Number</b>	<p>Karen Enstrom          Yolo Bypass Habitat Restoration Program          Division of Environmental Services          karen.enstrom@water.ca.gov          (916) 376-9778</p> <p>Ben Nelson          Bay-Delta Office          bcnelson@usbr.gov          (916) 414-2424</p>
<b>4. Project Sponsor's Name</b>	California Department of Water Resources
<b>5. Project Location</b>	<p>The project area includes Fremont Weir, a portion of the Fremont Weir Wildlife Area, two downstream agricultural road crossings in the Tule Canal, and an area within the northern Elkhorn Basin. Fremont Weir is located adjacent to the Sacramento River, between River Mile (RM) 82 and RM 84, along the northern boundary of the Yolo Bypass. The Yolo Bypass is located in Yolo County and extends from the Fremont Weir northeast of Woodland, California, south to the Cache Slough Complex near the city of Rio Vista, California. The project area is located within the United States Geological Survey 7.5-minute Knight's Landing, Gray's Bend, and Verona quadrangles.</p>
<b>6. General Plan Designation</b>	Agriculture
<b>7. Zoning</b>	Agricultural Intensive
<b>8. Surrounding Land Uses and Setting</b>	Surrounding land uses include agriculture and open space.

<b>9. Other Public Agencies Whose Approval may be Required</b>	The proposed project may require permits or approvals from the following: United States Army Corps of Engineers, National Marine Fisheries Service, United States Fish and Wildlife Service, Central Valley Flood Protection Board, California State Lands Commission, California Department of Fish and Wildlife, California Office of Historic Preservation, Yolo County, and the State Water Resources Control Board or Central Valley Regional Water Quality Control Board.
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## Environmental Factors Potentially Affected

### ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Aesthetics                         | <input type="checkbox"/> Agriculture and Forestry Resources       | <input checked="" type="checkbox"/> Air Quality               |
| <input checked="" type="checkbox"/> Biological Resources    | <input checked="" type="checkbox"/> Cultural Resources            | <input checked="" type="checkbox"/> Geology /Soils            |
| <input type="checkbox"/> Greenhouse Gas Emissions           | <input checked="" type="checkbox"/> Hazards & Hazardous Materials | <input checked="" type="checkbox"/> Hydrology / Water Quality |
| <input type="checkbox"/> Land Use / Planning                | <input type="checkbox"/> Mineral Resources                        | <input type="checkbox"/> Noise                                |
| <input type="checkbox"/> Population / Housing               | <input type="checkbox"/> Public Services                          | <input checked="" type="checkbox"/> Recreation                |
| <input type="checkbox"/> Transportation/Traffic             | <input checked="" type="checkbox"/> Tribal Cultural Resources     | <input type="checkbox"/> Utilities / Service Systems          |
| <input type="checkbox"/> Mandatory Findings of Significance |   |   |

### DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

\_\_\_\_\_  
Signature

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Date

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Signature

\_\_\_\_\_  
Date



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## Acronyms and Abbreviations

2009 NMFS BO	National Marine Fisheries Service's 2009 Biological Opinion and Conference Opinion on the Long-term Operations of the Central Valley Project and the State Water Project
AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
Alquist-Priolo Act	Alquist-Priolo Earthquake Fault Zoning Act
APE	area of potential effects
AQAP	air quality attainment plan
ARCFP	American River Common Features Project
ARIS	adaptive resolution imaging sonar
ASPA	Aboveground Petroleum Storage Act
basin plan	water quality control plan
Basin Plan	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region
BDCP	Bay Delta Conservation Plan
BMPs	best management practices
BO	biological opinion
BWFS	Sacramento River Basin-Wide Feasibility Study
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAL FIRE	California Department of Forestry and Fire Protection
CalEPA	California Environmental Protection Agency
CARB	California Air Resources Board
CBC	California Building Code
CBSC	California Building Standards Code
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife

DPR	California Department of Parks and Recreation
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
Cal OES	California Governor's Office of Emergency Services
CalEEMod	California Emission Estimates Model version 2013.2.2
CAP	Climate Action Plan: A Strategy for Smart Growth Implementation, Greenhouse Gas Reduction, and Adaptation to Global Climate Change
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFGF	California Fish and Game Code
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geology Survey
CH <sub>4</sub>	methane
CHP	California Highway Patrol
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CNRA	California Natural Resources Agency
CO	conference opinion
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> e	CO <sub>2</sub> equivalent
Conservation Strategy	Central Valley Flood System Conservation Strategy
CRHR	California Register of Historical Resources
CUPA	certified unified program agency
CVFMP	Central Valley Flood Management Planning

CVFPB	Central Valley Flood Protection Board
CVFPP	Central Valley Flood Protection Plan
CVP	Central Valley Project
CWA	Clean Water Act
cy	cubic yards
dB	decibels
dBA	A-weighted sound level
Delta	Sacramento-San Joaquin Delta
<i>E. coli</i>	<i>Escherichia coli</i>
EFH	essential fish habitat
EIR	environmental impact report
EIS	environmental impact statement
EIS/EIR	environmental impact statement/environmental impact report
Elkhorn Area	area within the northern Elkhorn Basin
EO	Executive Order
EPA	United States Environmental Protection Agency
EPOM	Environmental Permitting for Operations and Maintenance Project
ESA	federal Endangered Species Act
ESU	evolutionarily significant unit
FEMA	Federal Emergency Management Agency
FMMP	Farmland Mapping and Monitoring Program
FONSI	finding of no significant impact
FR	Federal Register
FWAFP, or proposed project	Fremont Weir Adult Fish Passage Modification Project
FWWA	Fremont Weir Wildlife Area
GGERP	Climate Action Plan Phase 1: Greenhouse Gas Emissions Reduction Plan
GHG	greenhouse gas

GIS	geographic information system
GRR	General Reevaluation Report
HCP/NCCP	habitat conservation plan/natural communities conservation plan
HFC	hydrofluorocarbon
HMMP	hazardous materials management plan
HSC	California Health and Safety Code
I-5	Interstate 5
I-80	Interstate 80
IPaC	Information, Planning, and Conservation System
IRWM	integrated regional water management
IS/EA	initial study/environmental assessment
IS/ND	initial study/negative declaration
ITA	Indian trust asset
kV	kilovolt
Leq	equivalent sound level
Lmax	maximum sound level
LOS	level of service
MBTA	Migratory Bird Treaty Act
mg/L	milligrams per liter
MND	mitigated negative declaration
MND/FONSI	mitigated negative declaration/finding of no significant impact
mtCO <sub>2</sub> e	metric tons of CO <sub>2</sub> e
N <sub>2</sub> O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NAVD88	North American Vertical Datum of 1988
NBA AIP	North Bay Aqueduct Alternate Intake Project

NEPA	National Environmental Policy Act
NF <sub>3</sub>	nitrogen trifluoride
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO <sub>x</sub>	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPPA	California Native Plant Protection Act
NTU	Nephelometric Turbidity Unit
NVCS	National Vegetation Classification Standard
NWIC	Northwest Information Center
PCA	Pesticide Control Advisor
PFC	perfluorocarbon
PG&E	Pacific Gas and Electric Company
PM <sub>10</sub>	particulate matter less than 10 microns in aerodynamic diameter
PM <sub>2.5</sub>	particulate matter less than 2.5 microns in aerodynamic diameter
PRC	Public Resources Code
RCRA	Resources Conservation and Recovery Act
RFMP	Lower Sacramento/Delta North Regional Flood Management Plan
Reach 1	channel extending from Fremont Weir to the deep pond
Reach 2	channel extending from the deep pond to the Tule Canal
Reclamation	United States Department of the Interior, Bureau of Reclamation
River and Harbors Act	River and Harbors Appropriation Act of 1899
RM	River Mile
ROG	reactive organic gas
RPA	Reasonable and Prudent Alternative
RWQCB	regional water quality control board



SBWA	Sacramento Bypass Wildlife Area
SEL	sound exposure level
SF <sub>6</sub>	sulfur hexafluoride
SHPO	State Historic Preservation Officer
SLC	California State Lands Commission
Southern DPS	Southern Distinct Population Segment
SPCCP	spill prevention, control, and counter-measure plan
SPFC	State Plan of Flood Control
SRBPP	Sacramento River Bank Protection Project
SRFCP	Sacramento River Flood Control Project
SRGRR	Sacramento River General Reevaluation Report
State SIP Strategy	State Strategy for the State Implementation Plan
SVAB	Sacramento Valley Air Basin
SWP	State Water Project
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TCR	tribal cultural resource
TDS	total dissolved solids
THPO	Tribal Historic Preservation Officer
TMDL	total maximum daily load
Triennial Plan Update	2015 Triennial Assessment and Plan Update
UAIC	United Auburn Community of the Auburn Rancheria of California
UBC	Uniform Building Code
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
Williamson Act	California Land Conservation Act of 1965

WRDA	Water Resources Development Act
YBWA	Yolo Bypass Wildlife Area
YHC	Yolo Habitat Conservancy
YSAQMD	Yolo-Solano Air Quality Management District



## **Revised Draft Initial Study/Environmental Assessment**

The Draft Initial Study/Environmental Assessment and Proposed Mitigated Negative Declaration are being recirculated pursuant to CEQA Guidelines 15073.5 to provide for public review and comment on substantial revisions. The Recirculated Draft IS/EA and Proposed MND are available for public review and comment from May 15 through June 13, 2017. Revisions are indicated by underline for new text and strikethrough for deleted text.

Reviewers should only provide comments on, and the lead agencies will only respond to comments on, the Biological Resources portion (Section 3.5) of the Recirculated Draft IS/EA and Proposed MND, which is the only portion of the document that contains substantial revisions. Additional, non-substantial revisions may be incorporated in the final version of the document.

## **1.0 Introduction**

This draft initial study/environmental assessment (IS/EA) was prepared by the California Department of Water Resources (DWR) and the United States Department of the Interior, Bureau of Reclamation (Reclamation) to assess the potential environmental effects of implementing the proposed Fremont Weir Adult Fish Passage Modification Project (proposed project). This document was prepared in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). This chapter provides a project overview and describes the project area, project background, purpose of and need for the project, intended uses of this document, anticipated approvals required for the project, and the organization of this document.

### **1.1 Project Overview**

DWR and Reclamation propose to:

- Modify the existing Fremont Weir fish ladder to provide improved upstream passage for salmonids and sturgeon when the Sacramento River overtops Fremont Weir and immediately after the Sacramento River recedes below Fremont Weir.
- Improve fish passage conditions in the channel that extends from the existing fish ladder upstream to the Sacramento River.
- Improve fish passage conditions in the scour channel that extends from the existing fish ladder downstream to an existing deep pond.
- Remove one earthen agricultural road crossing and replace one earthen agricultural road crossing with a structure that allows for improved fish passage through the Tule Canal and continued agricultural utility.

### **1.2 Project Area**

The project area (the equivalent of “action area” in NEPA documentation) is located in the northern half of the Yolo Bypass, near the towns of Woodland and West Sacramento in Yolo County, California. The project area includes Fremont Weir, a portion of the Fremont Weir Wildlife Area, Tule Canal, two downstream agricultural road crossings, and an area within the northern Elkhorn Basin (Elkhorn Area). The northern boundary of the project area is the Sacramento River bank immediately north of the existing Fremont Weir fish ladder. The Fremont Weir fish ladder is located between River Mile (RM) 82 and RM 84 and is approximately 0.62 mile west of the Yolo Bypass east levee. The southern boundary of the project area is an existing agricultural road crossing located in the Tule Canal, approximately 2.8 miles

south of Fremont Weir (Figure 1-1). The project area is located within the United States Geological Survey (USGS) 7.5-minute Knight's Landing, Gray's Bend, and Verona quadrangles.

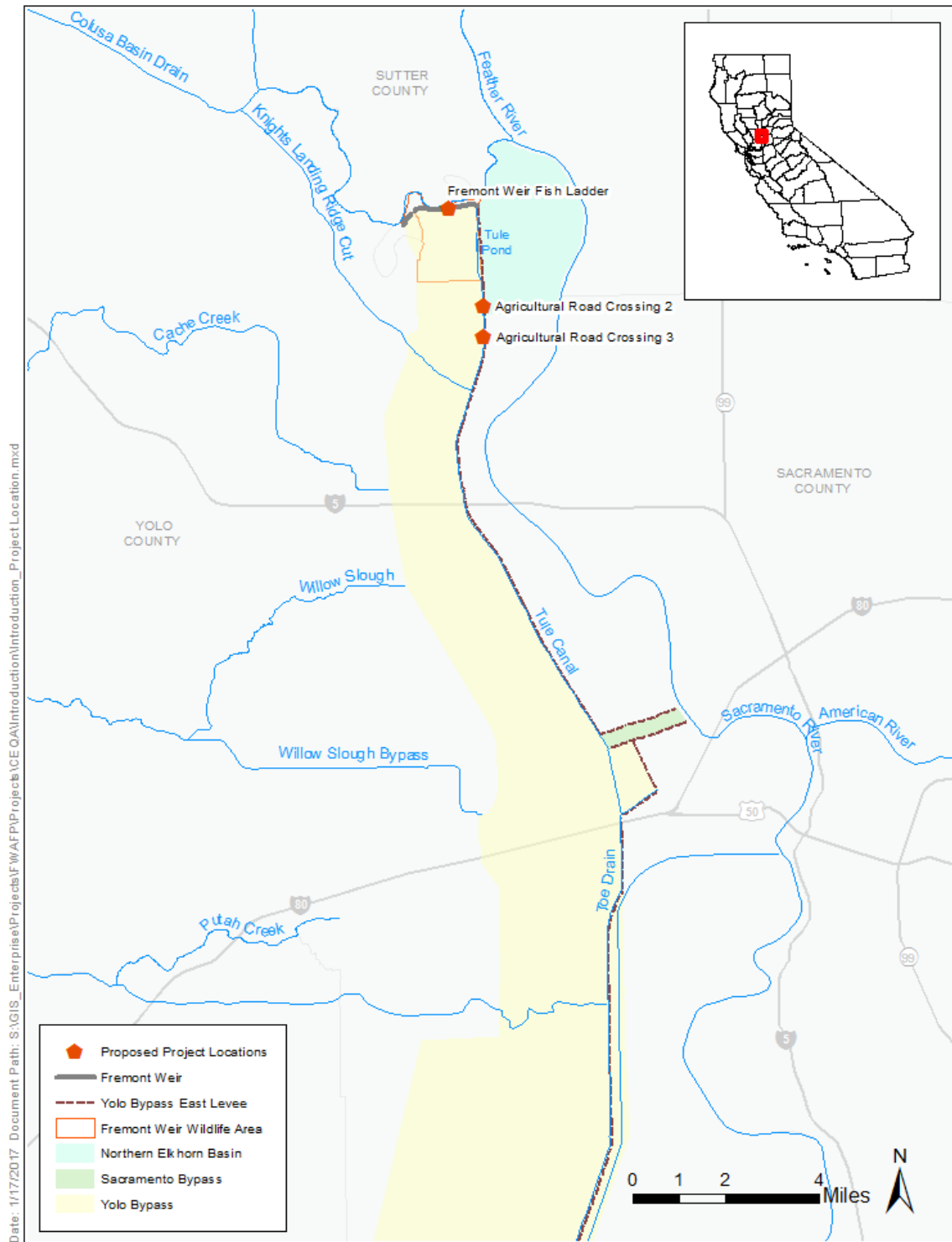
## 1.3 Project Background

### 1.3.1 Regulatory Compliance

DWR is responsible for operating and maintaining the State Water Project (SWP), and Reclamation is responsible for managing the Central Valley Project (CVP). The SWP and CVP deliver water to agricultural, municipal, and industrial contractors throughout California. The National Marine Fisheries Service's (NMFS's) 2009 Biological Opinion (BO) and Conference Opinion (CO) on the *Long-term Operations of the Central Valley Project and the State Water Project* (National Marine Fisheries Service 2009) specifies the need for more reliable fish passage through the Yolo Bypass. Reasonable and Prudent Alternative (RPA) Action I.7 of the 2009 NMFS BO states the need to reduce migratory delays and mortalities of federally listed fish species within the Yolo Bypass (National Marine Fisheries Service 2009). In addition to the 2009 NMFS BO, the California EcoRestore initiative was developed to coordinate and implement 30,000 acres of habitat restoration actions within the Sacramento-San Joaquin Delta (Delta), including the Yolo Bypass (California Natural Resources Agency 2015).

RPA Action I.7 focuses on adult and juvenile fish passage improvements in the Yolo Bypass for four federally listed anadromous species: the Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*); Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*); and California Central Valley steelhead (*Oncorhynchus mykiss*), which are collectively referred to as salmonids; and the Southern Distinct Population Segment (Southern DPS) of North American green sturgeon (*Acipenser medirostris*). Winter-run Chinook salmon are listed as endangered and the remaining three species are listed as threatened under the federal Endangered Species Act (ESA). Additionally, winter-run Chinook salmon are listed as endangered and spring-run Chinook salmon are listed as threatened under the California Endangered Species Act (CESA). The proposed project was designed by DWR and Reclamation to achieve partial compliance with RPA Action I.7 by improving adult fish passage in the Yolo Bypass.

**Figure 1-1 Proposed Project Location**



Source: Counties, CA Department of Forestry and Fire Protection 2015; Rivers and Streams, USGS National Hydrology Dataset 2011; Major Roads, CA Department of Transportation 2011; Yolo Bypass and Fremont Weir Wildlife Area, DWR 2014; Remaining Project Features, DWR 2016

### **1.3.2 Existing Project Area Features To Be Modified**

#### **1.3.2.1 Fremont Weir**

Fremont Weir is a 1.8-mile-long concrete structure designed to overtop and allow flow into the Yolo Bypass during high-flow events when the Sacramento River is higher than the 32-foot elevation (North American Vertical Datum of 1988 [NAVD88]) of the weir (California Data Exchange Center 2016). (The datum used for all elevations provided in this document is NAVD88.) The weir has a concrete stilling basin to minimize scouring during overtopping events at the weir. The stilling basin lies just downstream of the crest of the weir and spans the full length of the weir.

When the river stage is 2–3 feet higher than the weir, passage is possible for salmonids and, to a lesser extent, sturgeon. When the river stage is just barely above the crest of Fremont Weir, conditions make it difficult for salmonids to reach the Sacramento River and likely create a complete barrier for sturgeon.

Overtopping events can vary in duration from just a few days to several weeks, but are relatively short-lived compared with the resulting flooded footprint of the Yolo Bypass, which persists following the overtopping events. This flooded footprint is a result not just of overtopping at the Fremont Weir, but of Sacramento Bypass flow that enters from the east side of the Yolo Bypass and substantial out-of-channel flows from four Yolo Bypass westside tributaries: Knights Landing Ridge Cut, Cache Creek, Willow Slough, and Putah Creek.

Once the Sacramento River recedes below the crest of Fremont Weir, fish are likely to become stranded in the stilling basin, the old river channel (commonly referred to as “the oxbow”), the deep pond south of the existing fish ladder, the downstream scour channels, Tule Pond, or Tule Canal between the agricultural road crossings. The deep pond south of the existing fish ladder and Tule Pond are deep enough to hold fish year-round, but water quality conditions become unfavorable for native fishes to survive during the summer months.

Under existing conditions, for fish to volitionally reconnect with the Sacramento River, their arrival at Fremont Weir must coincide with one of two conditions.

1. The Sacramento River stage is high enough to allow fish to swim directly over the crest of Fremont Weir.
2. There is sufficiently deep water flowing through the Fremont Weir fish ladder (described below) to allow fish to reconnect with the river.

#### **1.3.2.2 Fremont Weir Fish Ladder**

The Fremont Weir fish ladder is a 4-foot-wide, 6-foot-deep concrete modified Denil-type fish ladder with a crest elevation of 31.8 feet (Figure 1-2) (California Data Exchange Center 2016). The fish ladder was constructed by the California Department of Fish and Game in 1965 (now known as the California Department of Fish and Wildlife [CDFW]). Denil-type fish ladders include a series of baffles to create variable velocities and facilitate salmonid passage. CDFW removed the baffles in the winter of 2015/2016 to widen the cross-sectional area, in an attempt to create conditions favorable to adult sturgeon passage.

CDFW manually opens the fish ladder when the Sacramento River stage recedes below the crest of Fremont Weir. The fish ladder is opened by removing wood stoplogs from the inlet of the fish ladder, which allows some adult migratory fish near this area to pass through the ladder and follow an earthen channel (Upstream Channel) to the Sacramento River (Figure 1-3).



When the Sacramento River recedes below the bottom elevation of the ladder (an approximate elevation of 26 feet), the ladder is closed by replacing the stoplogs. This process is repeated for subsequent Fremont Weir overtopping events.

The fish ladder is considered ineffective for three reasons. First, it is the only fish ladder located along the 1.8-mile span of Fremont Weir, which makes it difficult for all migratory fish to find during or following an overtopping event. Second, the bottom elevation of the ladder is too high to maintain a deep enough connection for sturgeon and salmonids for a sufficient duration. Third, Denil-type fish ladders are designed to provide passage specifically for salmonids and are considered inadequate for sturgeon. Although this Denil-type fish ladder has been widened by removing interior baffles, the 4-foot-wide entrance is still too narrow for sturgeon passage.

The ineffectiveness of the fish ladder is demonstrated by the number of salmonids and sturgeon that require rescue from the stilling basin after overtopping events. It is possible that these stranded fish do not find the ladder, avoid the ladder, or arrive at the ladder outside of its operational range (California Department of Fish and Game 2011; California Department of Fish and Wildlife 2016).

**Figure 1-2 View of Existing Modified Denil-type Fish Ladder with Stoplogs and Interior Baffles Removed, Looking Downstream**



#### ***1.3.2.3 Scour Channels and Deep Pond Extending Downstream from the Fremont Weir Fish Ladder***

As Fremont Weir begins to overtop, flows are initially contained within the prominent scour channels that extend from Tule Pond to Fremont Weir. During this time, flow and migratory fish are contained within the scour channels. If sufficient flows overtop Fremont Weir, there is enough depth to allow fish to move out of the scour channels and onto the floodplain. Yet, it is more likely that, because of increased depth and flow, fish will follow the prominent scour channels that extend from Tule Pond to Fremont Weir. Specifically, many fish are expected to follow the 1,300-meter-long scour channel that runs from Tule Pond to the deep pond (Reach 2) located just downstream of the existing fish ladder (Figure 1-3). That scour channel provides the most viable migratory pathway during Fremont Weir overtopping and as floodwaters begin to recede, because it conveys significant flow and is deeper and wider than other channels.

A poorly defined channel connects the deep pond to the stilling basin (Reach 1) at an area just southeast of the fish ladder. This channel is steep and shallow and does not provide favorable conditions for adult fish to swim from the deep pond to the Fremont Weir, unless the area is inundated during an overtopping event.

**Figure 1-3 Migratory Pathway Features for Fish When Yolo Bypass Floodwaters Recede**



#### *1.3.2.4 Tule Pond*

Tule Pond is an approximately 15-acre perennial pond in the Yolo Bypass located about 13 miles north of Interstate 80 (I-80) (Figures 1-1 and 1-3). It is likely that the pond is sustained by multiple sources, including impounded floodwater, leakage from an agricultural canal at its southern end, and groundwater.

Following overtopping events, adult sturgeon have been observed and rescued in Tule Pond (California Department of Fish and Wildlife 2016). These stranded fish may have attempted to migrate upstream on the tail-end of a Fremont Weir overtopping event, which left them unable to navigate closer to Fremont Weir. Another possibility is that these stranded fish successfully made it to Fremont Weir, but were unable to ascend the weir, and retreated back to Tule Pond.

#### *1.3.2.5 Tule Canal*

Tule Canal is a channel along the east side of the Yolo Bypass, which begins south of Tule Pond (Figure 1-1). Tule Canal receives water from westside tributaries and agricultural diversions almost year-round. Tule Canal also drains the initial flows from the Sacramento River when the river rises above the crest of Fremont Weir.

There are four earthen agricultural road crossings/impoundments in the Tule Canal that control water and provide access for vehicles and farming equipment from the Yolo Bypass east levee road to the agricultural fields. The crossings are commonly referred to as Agricultural Road Crossings 1, 2, 3, and 4, as one moves north to south along the Tule Canal. These structures control water during the agricultural season, but sometimes wash out during overtopping events.

Adult salmonids and sturgeon may experience delays if they encounter these agricultural road crossings at lower flows, when the agricultural crossings may not be submerged. The agricultural road crossings become submerged during higher flow conditions, such as when Fremont Weir overtops, eventually allowing salmonids or sturgeon to move beyond them. Adult or juvenile migratory fish, including salmonids and sturgeon, may become trapped in between these crossings as higher flows recede.

Fremont Weir receding flows drain into the Tule Canal and continue to provide attraction flows for fish in the Yolo Bypass after fish passage connectivity to the Sacramento River is compromised, which also contributes to stranding in this area (California Department of Fish and Wildlife 2016).

In addition to flows over Fremont Weir, the Yolo Bypass experiences significant and frequent inundation from Sacramento Bypass flow and westside tributaries, including Knights Landing Ridge Cut, Cache Creek, Willow Slough, and Putah Creek. When the tributaries convey a significant amount of flow, they allow fish to navigate into the northern portion of the Yolo Bypass via the Tule Canal. Prior to an overtopping event, fish are able to move as far north as Agricultural Road Crossing 3 (Figure 1-1). These fish are unable to move further upstream, unless the Sacramento River overtops Fremont Weir.

#### *1.3.2.6 Agricultural Road Crossing 2*

Agricultural Road Crossing 2 serves as an earthen road and as an irrigation flow-control structure for adjoining fields (Figures 1-1 and 1-4). This road crossing is the primary means of transporting heavy equipment across the Tule Canal.

The road crossing width ranges between 18 feet and 38 feet. The road crossing contains a 30-inch-diameter culvert placed north to south, and a 36-inch-diameter culvert located immediately downstream of and parallel to the road that drains water from the adjacent agricultural fields into the Tule Canal. The culvert within the earthen road crossing is undersized for reliable fish passage and is prone to clogging with vegetation and debris (Figures 1-5 and 1-6).

For adult fish to pass over Agricultural Road Crossing 2, Tule Canal must convey flows of approximately 1,000 cubic feet per second (cfs). Some fish passage may occur through the culverts at lower flows, but the culverts are more prone to clogging with debris at low flows. This road crossing is often partially washed out by high-flow events and must be rebuilt.

#### *1.3.2.7 Agricultural Road Crossing 3*

Agricultural Road Crossing 3 is located 0.7 mile south of Agricultural Road Crossing 2 (Figures 1-7 and 1-8). Being comparable in design to Agricultural Road Crossing 2, Agricultural Road Crossing 3 functions similarly to Agricultural Road Crossing 2 and creates similar fish passage obstructions.



**Figure 1-4 Agricultural Road Crossing 2 Overview**



**Figure 1-5 View of Upstream, Northern Face of Agricultural Road Crossing 2 (Looking South)  
Showing Excessive Vegetation Build-up Clogging an Undersized Culvert**



**Figure 1-6 View of Downstream Face of Agricultural Road Crossing 2 (Facing South)  
Showing Vegetation Build-up**





**Figure 1-7 Agricultural Road Crossing 3 Overview**





**Figure 1-8 View Upstream of Agricultural Road Crossing 3, Showing Vegetation Growth Concealing an Undersized Culvert Looking North on Road Crossing**



### **1.3.3 Other Existing Facilities in the Project Area**

The facilities described below are within the geographic range of the project area, but are not part of the proposed project.

#### **1.3.3.1 Agricultural Road Crossing 1**

Agricultural Road Crossing 1, which is the northernmost agricultural crossing in Tule Canal and is approximately 0.5 mile upstream of Agricultural Road Crossing 2, serves as a vehicular crossing and a water delivery feature. An earthen berm, just upstream of the road crossing, creates a cross canal that conveys water across the Yolo Bypass from Wallace Weir to two 36-inch culverts that pass through the Yolo Bypass east levee. The culverts deliver water via gravity flow into the Elkhorn Area for agricultural use.

The cross-canal berm is a flow barrier in the Tule Canal. The top of the berm has an elevation of approximately 21 feet, which backs up water originating from the Knights Landing Ridge Cut for conveyance east into the northern Elkhorn Basin (Figure 1-9). This cross-canal leaks in some years, which provides water inflow to the upstream wooded area and Tule Pond. Additionally, when overtopping of Fremont Weir ends and flows recede, the cross-canal berm continues to contain water, providing some leakage into the wooded area and Tule Pond. The local landowners make periodic repairs to the cross canal to decrease the leakage.

Agricultural Road Crossing 1 creates a migratory barrier for adult salmonids and sturgeon under low flows, which results in fish stranding. In addition, adult fish become stranded in Tule Pond upstream of Agricultural Road Crossing 1. It is unlikely that fish that move beyond Agricultural Road Crossing 1 would be able to make it back to Wallace Weir because of the potential for that area to become isolated

from Tule Canal after overtopping flows recede beneath the crest of Fremont Weir, resulting in stranding and the need for fish rescue at Fremont Weir.

If this upstream stranding results from fish attempting to migrate upstream on the tail-end of a Fremont Weir overtopping event, then minor modifications to the width and depth of the existing fish ladder would be unlikely to eliminate this type of stranding. The action required to provide passage for late-arriving fish is to greatly expand the amount of time in which passage conditions exist through construction of a deeper notch in Fremont Weir, which is the focus of the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project.

If fish passage were improved at Agricultural Road Crossing 1 prior to construction of the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project, then migratory fish could more easily ascend into the upper Yolo Bypass during non-overtopping events. This condition could potentially increase the risk of stranding and increase existing fish-rescue efforts.

If Agricultural Road Crossing 1 is left in place until a deeper notch can be constructed, then fish that arrive at this area after an overtopping event would have the opportunity to be redirected to the Wallace Weir fish rescue facility (described below). Fish not redirected to the Wallace Weir fish rescue facility can continue to migrate downstream in the Tule Canal/Toe Drain and exit the Yolo Bypass at the southern end.

DWR and Reclamation are committed to resolving this stranding issue by implementing the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project, which would provide reliable passage at Fremont Weir and Agricultural Road Crossing 1 over a greater range of flows, thus reducing the need for fish rescue at Fremont Weir.

#### *1.3.3.2 Agricultural Road Crossing 4*

Agricultural Road Crossing 4 is located 10.3 miles downstream of Agricultural Road Crossing 3 and 9.0 miles downstream from the confluence of the Knights Landing Ridge Cut cross canal and the Tule Canal (Figure 1-10).

The road crossing, which controls irrigation for agricultural and waterfowl purposes, has two 48-inch-diameter culverts controlled by stoplogs and one 72-inch-diameter culvert with a cable-operated slide gate. This road crossing is accessed by both maintenance vehicles and agricultural equipment.

The larger (72-inch-diameter) culvert may provide adequate salmonid passage, under some conditions, but its ability to pass sturgeon is unknown. It is likely that most adult fish passage occurs once flows overtop the crossing. Debris can become clogged in the culverts, further reducing fish passage. The crossing is often partially washed out by high-flow events and must be rebuilt.

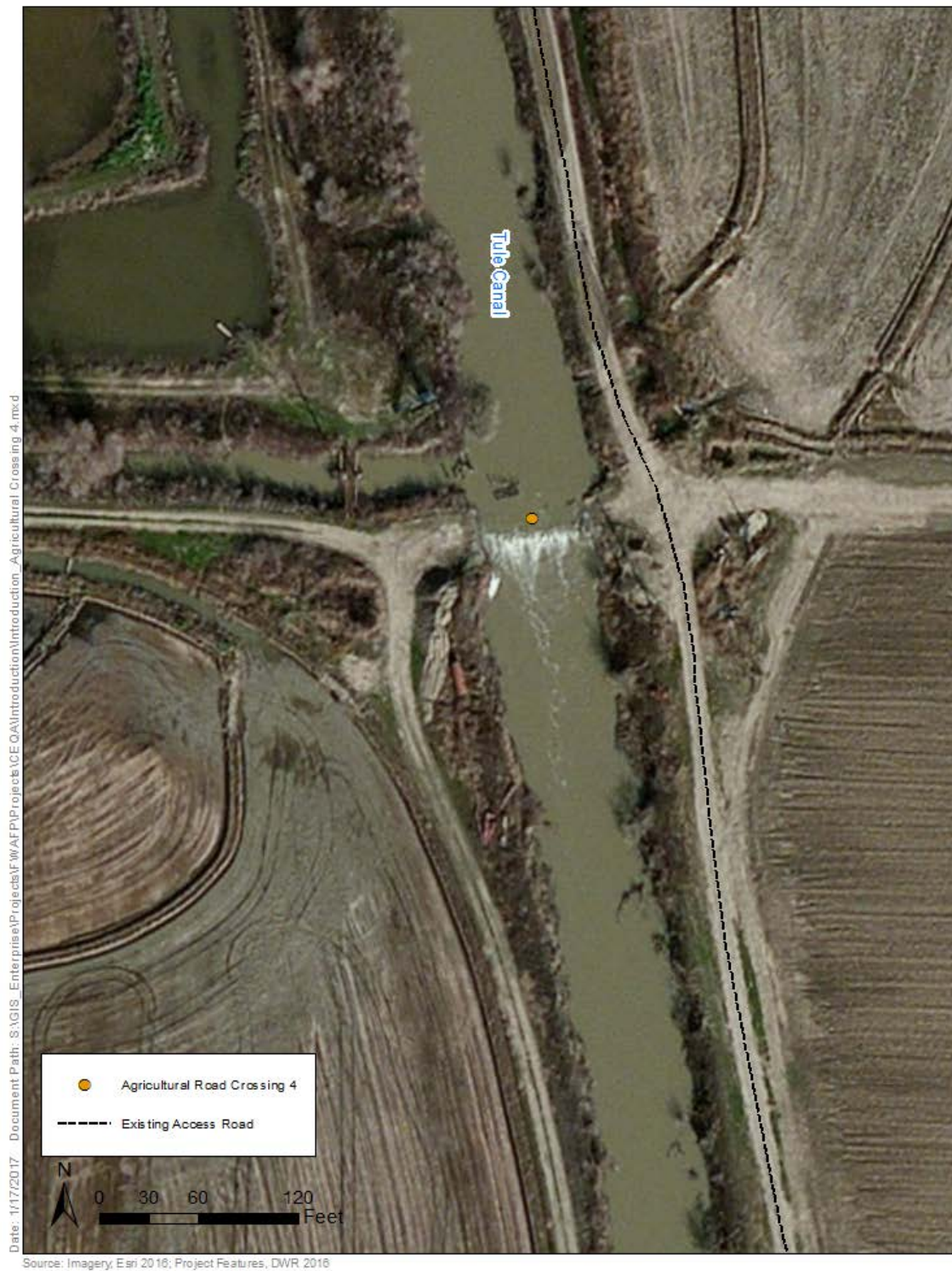
When this road crossing is not passable, fish upstream of the road crossing can continue to migrate up the Tule Canal and be redirected to the Wallace Weir fish rescue facility. Similarly, fish downstream of the road crossing can continue to migrate downstream in the Tule Canal/Toe Drain and exit from the southern end of the bypass into the Sacramento River.

**Figure 1-9 Agricultural Road Crossing 1 Overview**





**Figure 1-10 Agricultural Road Crossing 4 (Partially Submerged) Overview**



When this road crossing is not passable as a result of inadequate flows, the fish experience migratory delays until the road crossing is passable. But the landowner's staff frequently visit this road crossing and work with CDFW to address stranding/migratory delays for fish species of interest when observed.

Under a future project, DWR and Reclamation are committed to improving fish passage at Agricultural Road Crossing 4 while maintaining water supply reliability for the landowner.

#### *1.3.3.3 Wallace Weir*

Beginning in January 2014, CDFW set a fyke trap in the Yolo Bypass to rescue salmonids and sturgeon that strayed toward Wallace Weir, which is the terminus of the Knights Landing Ridge Cut (Figure 1-1). When the Knights Landing Ridge Cut flow was low, CDFW deployed this temporary fyke trap, which resulted in rescuing several hundred salmonids unable to volitionally reconnect with the Sacramento River. Under modest flows, however, the trap became compromised and fish rescue became unsafe and ineffective.

In August 2016, construction began to replace Wallace Weir, which was an earthen weir that had to be constructed annually, with an improved permanent structure that includes a fish rescue facility that can remain operational under low and high flows.

In the near-term, the newly constructed fish collection facility at Wallace Weir will provide a means of fish passage, in addition to volitional passage that occurs at Fremont Weir, and allow a method for rescuing fish that are unable to ascend Agricultural Road Crossing 1.

In the long-term, DWR and Reclamation are committed to implementing the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project, which would provide reliable passage at Fremont Weir over a greater range of flows, thus reducing the need for fish rescue at Wallace Weir.

#### *1.3.3.4 Toe Drain*

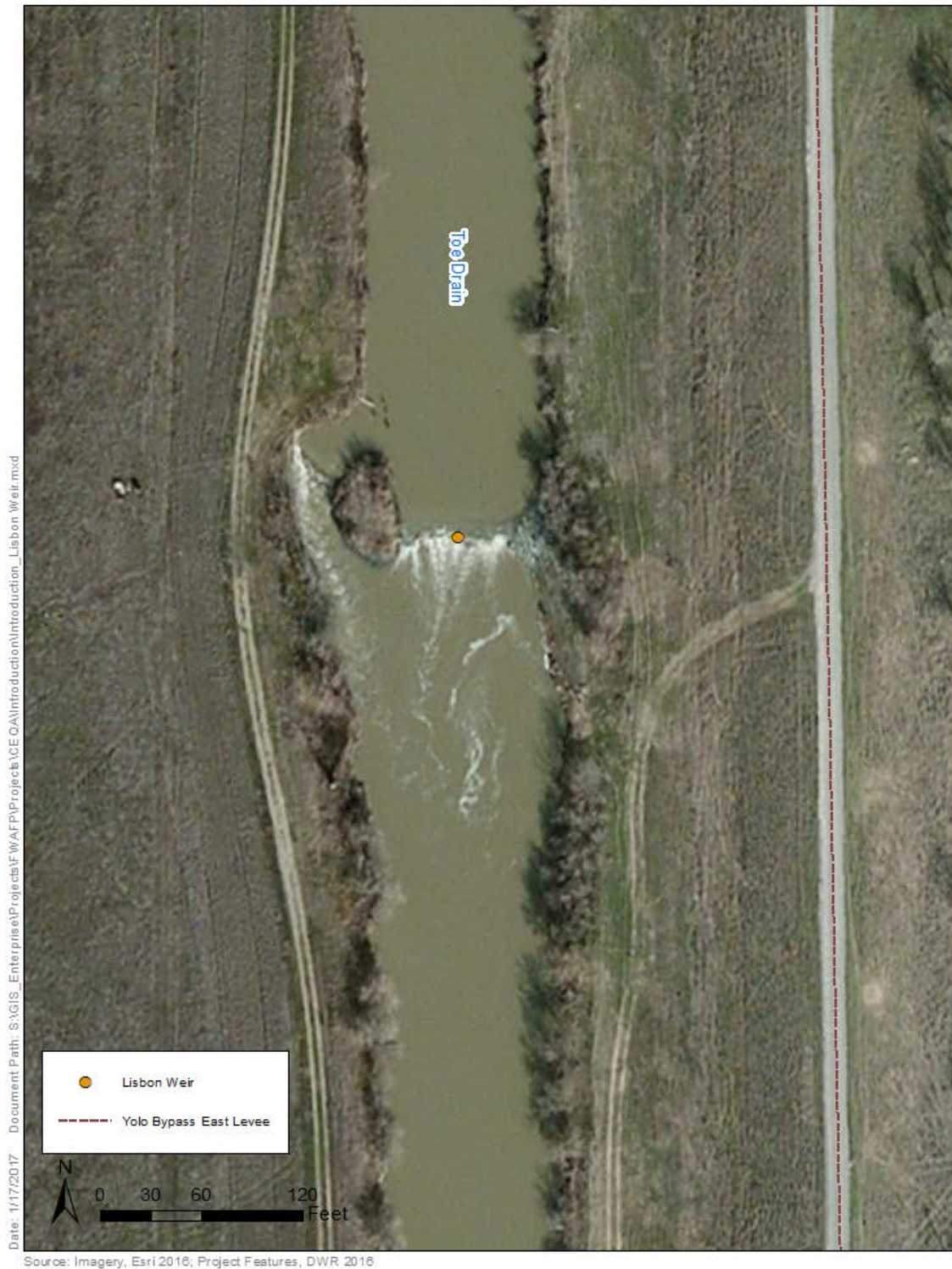
Tule Canal becomes the Toe Drain south of the I-80 Yolo Causeway (Figure 1-1). The perennially wetted Toe Drain extends south approximately 20 miles and becomes increasingly tidal as it connects with Cache Slough, past the Lower Yolo Bypass.

The Toe Drain receives water from westside tributaries and agricultural diversions almost year-round. During non-flooded periods, sturgeon and migrating adult salmonids enter the Toe Drain at the south end of the Yolo Bypass. Fish are likely drawn into the Yolo Bypass initially by the tidal flux that occurs near Cache Slough, but could be encouraged to continue to move north into the Yolo Bypass, depending on outflow from tributaries and the Sacramento River.

#### *1.3.3.5 Lisbon Weir*

Lisbon Weir is the southernmost water-control structure that crosses the Toe Drain. Lisbon Weir provides higher and more stable water levels to water users north of the weir. The weir is comprised of an earthen island, a rock weir, and flap gates. The main part of the weir is on the east side of the earthen island, which includes the rock weir reinforced on the downstream side with sheet piling. On the west side of the earthen island, there is a structure with tidally operated flap gates that impounds water on the ebb tide (Figure 1-11).

Figure 1-11 Lisbon Weir Overview





Lisbon Weir provides some adult fish passage at higher tides or higher net outflows. When the Yolo Bypass is not flooded, adult migrating fish can pass this rock weir only when flood tides open a small section of flap gate or when a strong high tide overtops the weir.

#### 1.4 Project Purpose and Need

The primary purpose of the proposed project is to:

- Provide enhanced fish passage opportunities for federally listed and State-listed salmonids and green sturgeon during and immediately following a Fremont Weir overtopping event.
- Reduce fish stranding in the Fremont Weir Wildlife Area.
- Improve fish passage in the Tule Canal.

The proposed project would facilitate partial compliance with RPA Action I.7 by providing connectivity to the Sacramento River during and immediately following an overtopping event.

The northern section of the Yolo Bypass drains quickly following an overtopping event, causing salmonids and sturgeon to become stranded in the isolated sections of the scour channels near Fremont Weir. If the fish ladder were deeper and wider, it would allow additional flow to increase the hydrologic connection between the scour channels and the Fremont Weir stilling basin, thus allowing more time for fish to ascend the northern Yolo Bypass following an overtopping event.

The existing ladder has relatively low flow coming through it and is unlikely to provide a sufficient attraction for migrating fish. A larger flow signal through the ladder would provide a cue for migratory fish to ascend toward the ladder. The existing fish ladder is too narrow to provide reliable passage for sturgeon. A wider ladder would better accommodate adult sturgeon. Additionally, the existing fish ladder often lacks sufficient depth because of its high invert (i.e., bottom) elevation. A deeper invert elevation would result in sufficient depth for longer periods of time, increasing the likelihood of adult salmonid and sturgeon passage during and following overtopping events (see Table 2-1 for adult fish passage criteria).

The existing agricultural road crossings restrict the flow of water down the Tule Canal, creating partial-to-complete barriers to adult fish passage, depending on flow. Resizing Agricultural Road Crossing 2 and resizing the former site of Agricultural Road Crossing 3 after its removal — to better match the dimensions of the Tule Canal — would allow for improved fish passage through Tule Canal during and following overtopping events. This would increase access to either the modified fish passage structure at Fremont Weir or the fish rescue facility at Wallace Weir, depending on flow.

#### 1.5 Purpose and Intended Use of this IS/EA

The purpose of this IS/EA is to describe the potential environmental impacts (the equivalent of “environmental consequences” in NEPA documentation) of the proposed project, and to describe measures that would avoid or mitigate potentially significant environmental impacts. This document is intended to meet the requirements of both CEQA and NEPA. Under CEQA, an IS helps a lead agency determine whether a project would have a significant effect on the environment and, in turn, determine whether a negative declaration (ND), mitigated negative declaration (MND), or environmental impact report (EIR) should be prepared. Under NEPA, the purpose of the EA is to provide sufficient analysis for determining whether to prepare an environmental impact statement (EIS) or a finding of no significant impact (FONSI).

This document was prepared in accordance with NEPA regulations, Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1500–1508), and Department of the Interior Regulations (43 CFR Part 46). Authority for combined federal and State documents is provided in the CEQ Regulations, specifically 40 CFR 1506.4 (Combining Documents) and in California Code of Regulations (CCR) Title 14, Division 6, Chapter 3 (State CEQA Guidelines), Section 15222 (Preparation of Joint Documents). Additionally, this document is consistent with the CEQ and the California Governor’s Office of Planning and Research draft handbook on integrating NEPA and CEQA (*NEPA and CEQA: Integrating State and Federal Environmental Reviews*) issued in 2013. The decision to prepare a joint IS/EA, as opposed to two separate CEQA and NEPA documents, is intended to present the public with a single project analysis resulting from an efficient and cost-effective collaboration between DWR and Reclamation.

### 1.6 Other Public Agencies Whose Approval May Be Required

Several federal, State, regional, and local agencies, as well as decision-making bodies, have jurisdiction over resources that may be affected by the proposed project, or have other permitting or regulatory authority over certain aspects of the project. The agencies and decision-makers in this list will review the information contained in this IS/EA, and will consider it in their decision-making process.

- United States Army Corps of Engineers.
- National Marine Fisheries Service.
- United States Fish and Wildlife Service.
- Central Valley Flood Protection Board.
- California Department of Fish and Wildlife.
- California Office of Historic Preservation.
- Central Valley Regional Water Quality Control Board.
- State Water Resources Control Board.
- Yolo County.

### 1.7 Document Organization

This IS/EA includes the following chapters:

- **Chapter 1, Introduction.** This chapter describes the purpose, need, and location of the proposed project; provides the project background; explains the intended use of this IS/EA; and lists other public agencies whose approval may be required for the proposed project.
- **Chapter 2, Description of the Proposed Project and No-Action Alternative (the equivalent of “no project” in CEQA documentation).** This chapter describes the No-Action Alternative and the proposed project. For the proposed project, project components evaluated in this IS/EA and the construction, operation, and maintenance activities associated with implementation of the proposed project are described.
- **Chapter 3, Environmental Setting, Discussion of Impacts, and Mitigation Measures.** This chapter describes the environmental setting (the equivalent of “affected environment” in NEPA documentation) for each resource, and discusses the potential environmental impacts associated with implementation of the proposed project. It also identifies mitigation measures, where necessary, to reduce significant impacts to less-than-significant levels.
- **Chapter 4, Cumulative Impacts.** This chapter describes other projects that have the potential to affect the same resources as the proposed project and discusses the potential for cumulatively considerable effects.



- **Chapter 5, Consultation and Coordination.** This chapter describes the agencies and organizations consulted throughout the development of the environmental documentation effort for the proposed project.
- **Chapter 6, List of Preparers.** This chapter lists the preparers of the IS/EA and other agency staff who contributed to the preparation of this document.
- **Chapter 7, References.** This chapter lists the references and personal communications used to prepare this IS/EA.

## 2.0 Description of the Proposed Project and No-Action Alternative

This chapter describes the construction, operation, and maintenance activities associated with proposed modifications to existing facilities within the project area (the proposed project). This chapter also describes the No-Action Alternative. The No-Action Alternative reflects future conditions without the proposed project and serves as a basis of comparison for determining potential impacts on the human environment that would result from implementation of the proposed project.

### 2.1 No-Action Alternative

Under the No-Action Alternative, no construction activities would occur to enhance fish passage at the Fremont Weir fish ladder, in Tule Canal, or in the channels upstream and downstream of the fish ladder. Beneficial effects on fish passage would not occur and delayed fish passage and stranding would continue in the Yolo Bypass.

### 2.2 Proposed Project

DWR and Reclamation propose to modify the following elements in the project area:

- The existing Fremont Weir fish ladder and stilling basin.
- The upstream channel that connects the Sacramento River to the existing Fremont Weir fish ladder (Upstream Channel).
- The downstream channel that connects the existing Fremont Weir fish ladder to the deep pond (Reach 1).
- Agricultural Road Crossing 2 in the Tule Canal.
- Agricultural Road Crossing 3 in the Tule Canal.

#### 2.2.1 Proposed Modifications to Existing Facilities in the Project Area

##### 2.2.1.1 Fremont Weir Fish Ladder Modification

The existing Fremont Weir fish ladder and upstream and downstream adjoining channels would be widened and deepened to increase depth and decrease velocity for salmonids and sturgeon. In addition, the maximum target flow through the fish passage structure would be limited to approximately 1,100 cubic feet per second (cfs) when the Sacramento River reaches an elevation of 31.8 feet, the point at which Fremont Weir begins to overtop. This flow target would minimize impacts on existing land uses in the Yolo Bypass and avoid impacts on water diverters along the Sacramento River.

The following adult fish passage criteria (Table 2-1) were adopted through a multi-agency team known as the Yolo Bypass Fisheries and Engineering Technical Team. The criteria are similar to those used for adult salmonids but incorporate a greater minimum bottom width for sturgeon.

**Table 2-1 Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project Adult Fish Passage Criteria**

<b>Fish Species</b>	<b>Typical Adult Migration Time</b>	<b>Minimum Depth of Flow (Short Distance: &lt; 60 feet)</b>	<b>Minimum Depth of Flow (Long Distance: ≥ 60 feet)</b>	<b>Minimum Width</b>	<b>Maximum Velocity (Short Distance)</b>	<b>Maximum Velocity (Long Distance)</b>
Adult sturgeon	January–May	3 feet	5 feet	10 feet	6 feet/second	4 feet/second
Adult salmonids	November–May	1 foot	3 feet	4 feet	6 feet/second	4 feet/second

Source: California Department of Water Resources 2016

To best comply with these adult fish passage criteria, the existing fish ladder would be lowered from a bottom elevation of 26 feet to an elevation of 22 feet. The existing 4-foot-wide ladder would be replaced by a fish passage structure. The components of the fish passage structure would include a sheet pile wall, concrete wing walls, concrete rectangular gate housing, and a concrete box culvert. In addition to more favorable depth and velocity, the increased cross-sectional area would provide a greater attraction flow, making it easier for fish to find and ascend the fish passage structure.

To address potential underseepage issues identified in the Geotechnical Assessment (Appendix A), a sheet pile wall would be located beneath and embedded on the upstream side of the fish passage structure. The sheet pile wall would extend 30 feet beyond each side of the structure. The sheet piles would be driven to an elevation of negative 7 feet and extend to existing grade beyond the sides of the structure. Concrete wingwalls 24 feet long would be placed at 45 degree angles to the concrete gate housing. The wingwall height would begin 2 feet above the trapezoidal channel finished grade and end at a height of 10 feet at the concrete gate housing.

The concrete rectangular-shaped gate housing would be 14 feet long by 15 feet wide and would house an 11-foot, 8-inch tall bottom-hinged steel gate (Figure 2-1). The gate would be raised and lowered by inflatable air bladders (Figure 2-2). The bladders would raise and lower the gate that would control flow through the structure (Figure 2-3). The gate would require an operation control unit, air compressor, and power supply to allow pre-programmed and remote operation of the gate. The power supply and control unit would consist of a battery bank, solar panels, and an inverter. All elements needed to provide remote gate operation would be located on a raised equipment platform.

The raised equipment platform would be approximately 50 feet northwest of the fish passage structure, upstream of Fremont Weir (Figure 2-3). The steel equipment platform would be elevated by four 30-inch-wide steel columns. The width of the steel columns would be confirmed prior to final design. The steel columns would each be buried in a 4.5-foot by 4.5-foot by 3.0-foot concrete spread footing for the foundation. The dimensions of the platform would be 15 feet by 15 feet. The bottom of the platform would be at an elevation of 47 feet, and the top of the footing would match the existing grade elevation of 29 feet. The equipment platform would be enclosed by guardrails, with steel plates on the outside of the guardrails, for the protection of the solar, communication, and electrical/mechanical equipment components. The power supply would also enable operation of an adaptive resolution imaging sonar (ARIS) system that would monitor how fish behave at the fish passage structure (see Appendix B for a

description of the Post-Construction Monitoring Evaluation and Adaptive Management Plan). Concrete-encased duct bank would connect all electrical and air lines from the platform to the fish passage structure.

The concrete box culvert would be located downstream of the gate housing. The concrete box culvert would be 16 feet long, with a transitional width from 15 feet wide at the upstream end to 25 feet wide at the downstream end. The transition would occur over the first 11 feet of the structure. The top elevation of the concrete box culvert would be 32 feet, the top wall thickness would be 1.5 feet, and the inside height of the box culvert would be 8 feet, 6 inches tall. The floor of the box culvert would have a 15-foot bottom width at elevation 22 feet, with 3:1 side-slope transitions along both sides. The concrete box culvert would be traffic-rated to accommodate expected equipment that operates within the bypass and would be aligned perpendicular to the existing access road to allow for continued access. The downstream end of the box culvert would include a recessed housing for installation of the ARIS fish-monitoring system. The concrete box culvert would open up into a 34-foot-long concrete transition channel. The concrete transition would begin with a 7-foot-long by 10-foot-tall vertical headwall extending from the concrete box culvert through the existing weir wall. The headwall would include waterstop expansion joints to connect to the existing weir. The channel floor through the headwall would be 25 feet wide, with a 15-foot bottom width and 3:1 side-slope transitions. The remaining 27 feet of the concrete transition would extend through the existing stilling basin and include a channel bottom width of 15 feet, 3:1 side-slope transitions, and a top width of 40 feet. The concrete channel transition would terminate at an earthen outlet channel.

### *2.2.1.2 Fremont Weir Stilling Basin Modification*

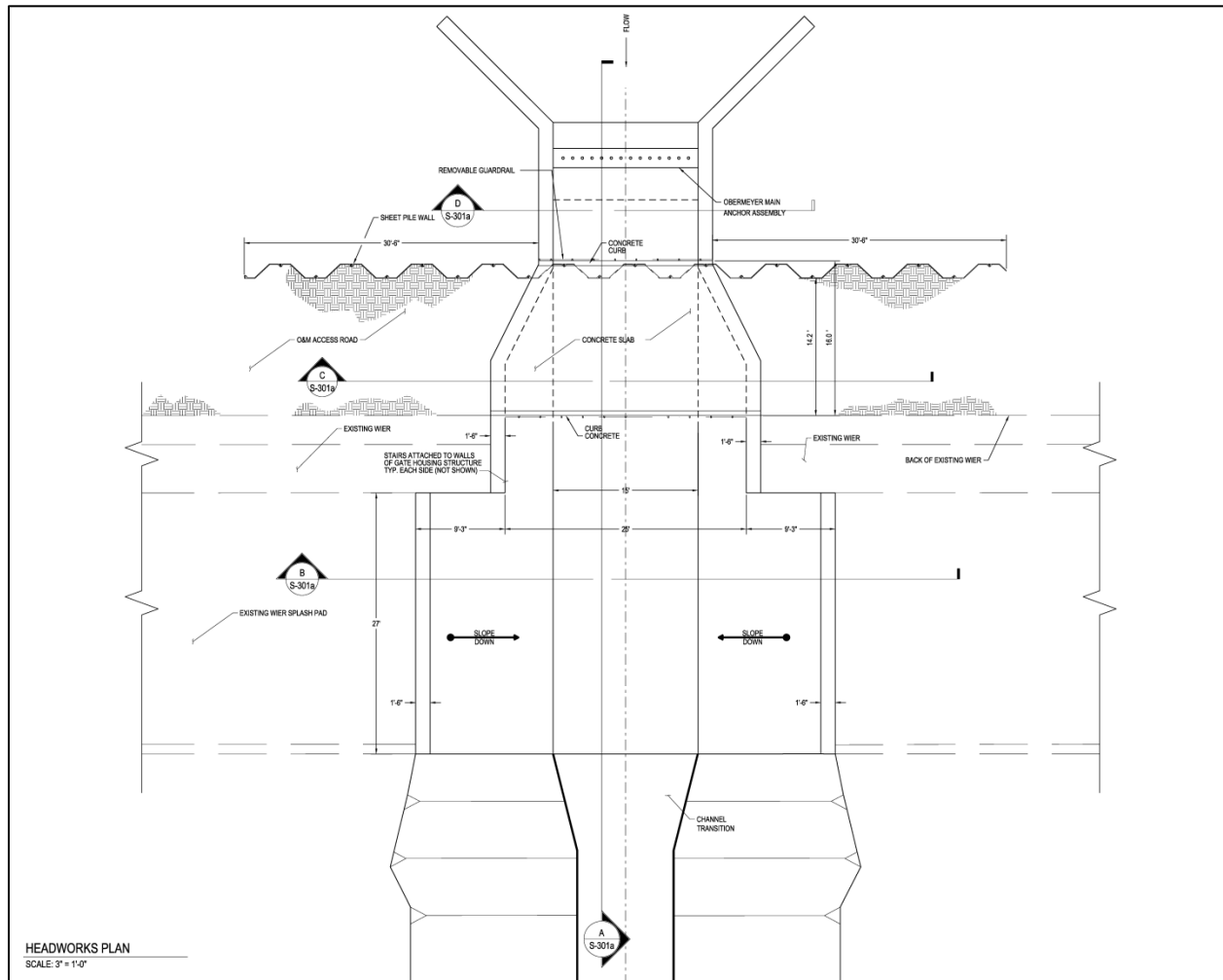
The portion of the Fremont Weir stilling basin in line with the fish passage structure location would be lowered to an invert elevation of 22 feet, with a 15-foot bottom width and 3:1 side slopes that tie into the existing bottom of the stilling basin. The modified section of the stilling basin would serve as the transition from the fish passage structure to Reach 1 (Figure 2-1).

The modified area would become the deepest portion of the stilling basin. As the deepest point, it would be likely to attract fish as the stilling basin drains. This configuration is predicted to further reduce stranding in the stilling basin by increasing the likelihood of connecting with the Sacramento River.

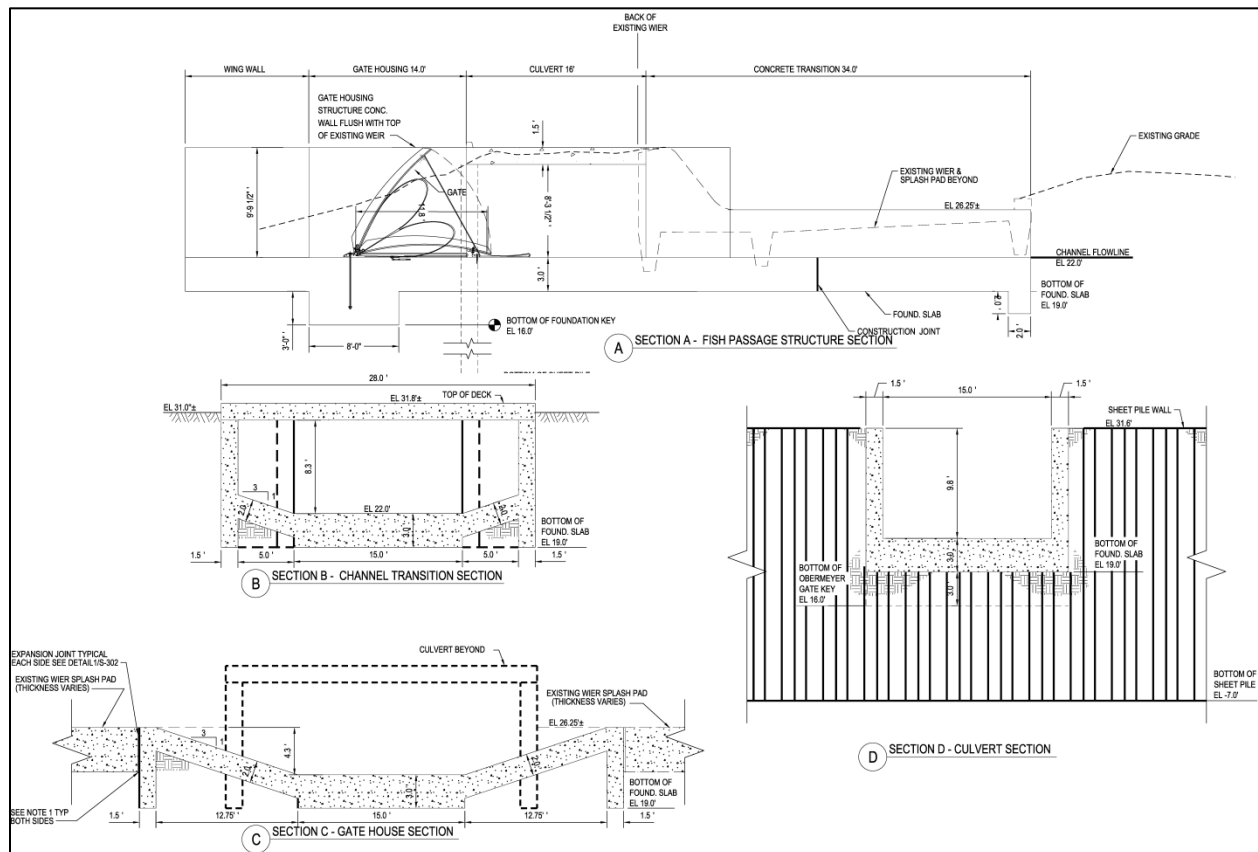
### *2.2.1.3 Upstream Channel Modification*

The Upstream Channel would provide connection from the fish passage structure to the Sacramento River for salmonids and sturgeon in the bypass as flood waters recede (Figure 2-3). The Upstream Channel would be excavated, compacted, lined with filter fabric, and include 1 foot of aggregate-base-rock slope protection, with 1 foot of engineered streambed material to final grade (12-inch D100 round riprap). The channel would be 400 feet long, with a 10-foot-wide bottom and 3:1 side slopes. It would start at the Sacramento River, with a final grade bottom elevation of 21 feet. It would slope upward toward Fremont Weir and, at an elevation of 22 feet, would terminate at the upstream end of the fish passage structure. Starting at the wing walls of the fish passage structure, the channel would transition from a 10-foot-wide bottom to a 15-foot-wide bottom, to match the width of the opening of the concrete gate housing. This negative upstream slope would allow the fish passage structure to drain toward the Sacramento River at lower stages.

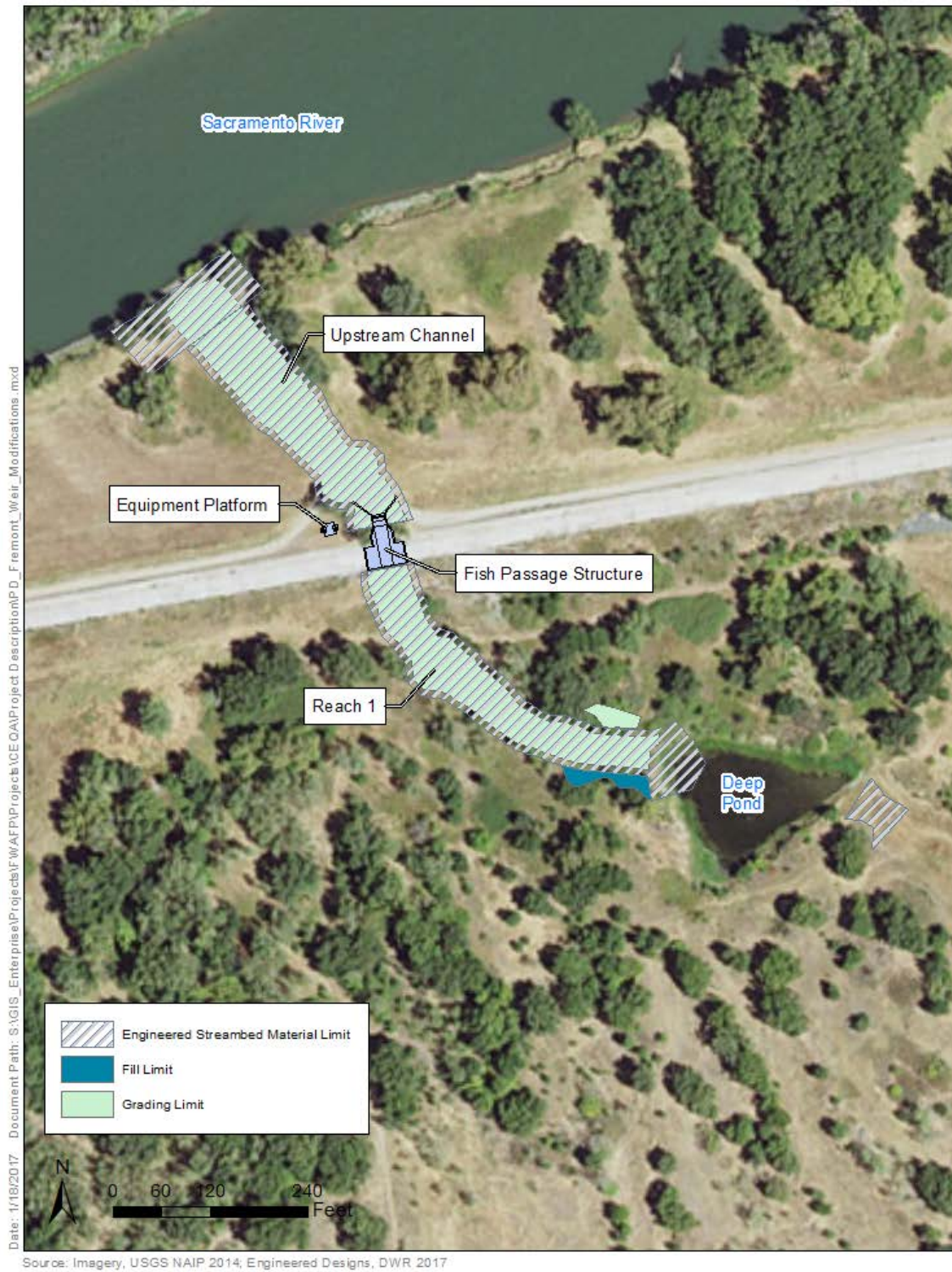
**Figure 2-1 Plan View of the Fremont Weir Fish Passage Structure**



**Figure 2-2 Cross-section Views of the Fremont Weir Fish Passage Structure**



**Figure 2-3 Proposed Upstream Channel and Reach 1 Modifications**





The area where the Upstream Channel meets the Sacramento River would be lined with Class 3 round riprap down to an elevation of 17 feet, which is the estimated average maximum stage elevation of the river in the summer. The dimension of the lined area would be approximately 175 feet long by 75 feet wide. No in-water work is planned because the limit of work is anticipated to be above the estimated average stage elevation in the summer. If the river stage were to reach the estimated average maximum stage of 17 feet, then activities would be planned such that placement of riprap would not require in-water work.

A 50-foot portion of the Upstream Channel, located approximately 40 feet upstream of the fish passage structure and in line with an existing earthen road, would transition from a 3:1 side slope to a slope of 5:1 for 20 feet, then transition back to a 3:1 slope to allow vehicles to continue using the earthen road. The earthen road would generally be limited to use by maintenance vehicles, as the primary road crossing would be constructed over the top of the concrete box culvert.

### *2.2.1.4 Reach 1 Modification*

Reach 1 would be realigned and deepened to connect the fish passage structure to the deep pond south of the stilling basin (Figure 2-3). The bottom elevation at the upstream end of Reach 1 would be 22 feet, to match the bottom elevation of the fish passage structure. The first 10 feet of Reach 1 would transition from a 15-foot bottom width to a 10-foot bottom width throughout the remaining length of the channel. The entire channel would have 3:1 side slopes. The alignment of Reach 1 would curve toward the east and then back toward the deep pond to lengthen the reach to 400 feet, which would achieve a desirable slope for fish passage as it connects to the deep pond at an elevation of 20 feet.

The majority of the channel would be excavated, compacted, and lined with filter fabric, and would include 1 foot of aggregate-base-rock slope protection, with 1 foot of engineered streambed material to final grade. A 100-foot segment of Reach 1, near the deep pond, would be backfilled with approved fill material and compacted to raise the elevation to the proposed final grade prior to placing filter fabric, 1 foot of aggregate-base-rock slope protection, and 1 foot of engineered streambed material.

A 50-foot portion of Reach 1, located approximately 100 feet downstream of the fish passage structure and in line with an existing earthen road, would transition from 3:1 side slopes to 5:1 side slopes for 20 feet. It then would transition back to 3:1 side slopes to allow vehicles to traverse the channel and continue using the earthen road.

To better meet fish passage criteria, the outlet of the deep pond would be raised from the side slope of the deep pond toward Reach 2 for 55 feet at a slope of 15:1 to elevation 20.5, and would transition back to existing grade at a 4:1 slope for approximately 10 feet. The raised section would be 75 feet wide. The area would be raised with approved backfill material and compacted prior to placing filter fabric armored with 1 foot of engineered streambed material.

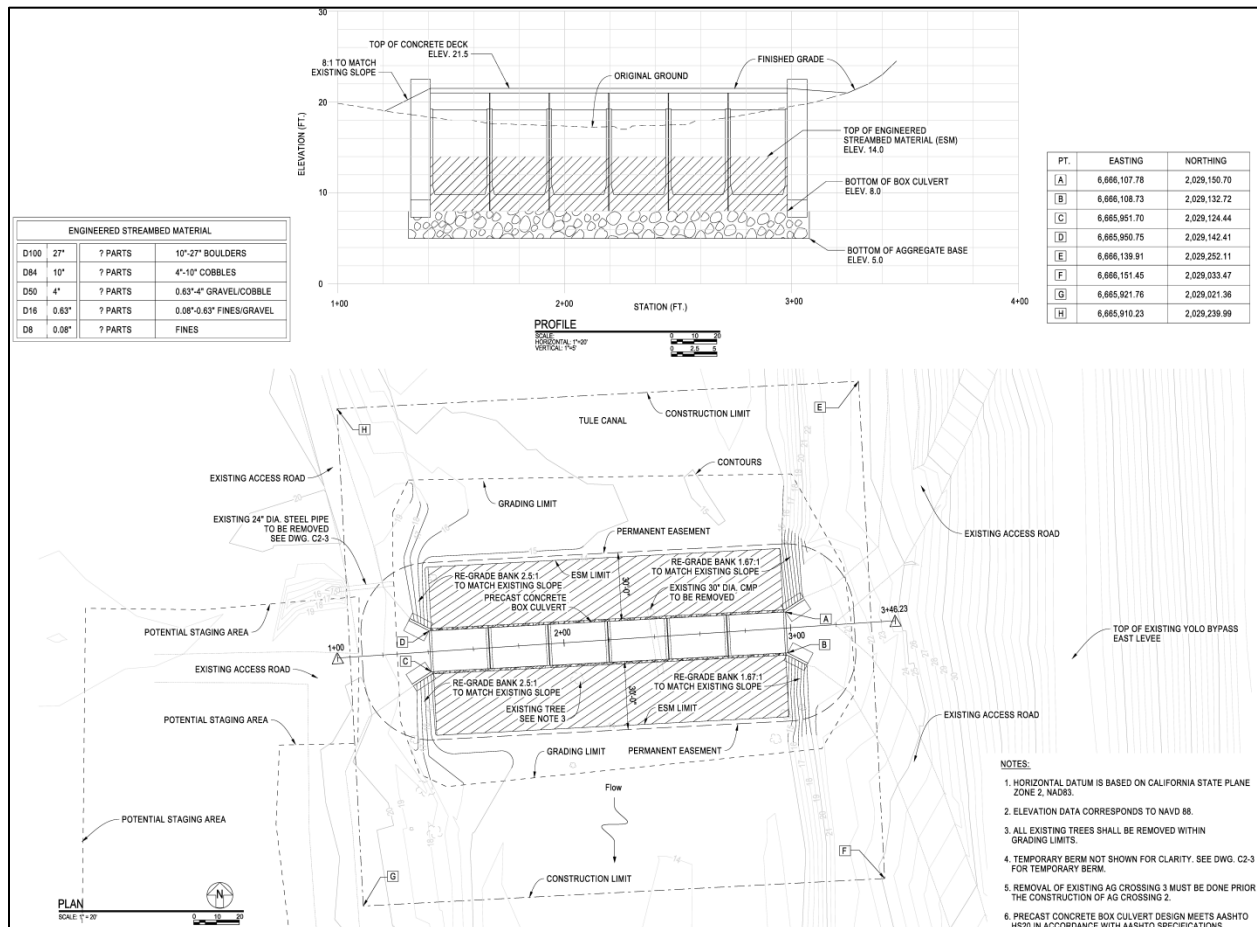
### *2.2.1.5 Agricultural Road Crossing 2 Modification*

The hydraulic capacity of Agricultural Road Crossing 2 would be increased to more closely match that of the Tule Canal, by replacing the earthen road crossing with a bridge. This design would ensure that fish could pass the structure when hydraulic conditions allow fish to reach the structure. The bridge would be constructed with six precast concrete box culverts. Each culvert would have a 24-foot inside width, with a 9-foot, 4-inch inside height and an 18-foot total length, likely in 6-foot segments. The wall thickness



would be 1 foot, 10 inches at the top and bottom and 1 foot on the sides. The culverts would be placed side by side and sealed with 3 inches of slurry cement (Figure 2-4). The total length of the bridge would be 157 feet, 3 inches. Cast-in-place wing walls would be placed at either end of the bridge. The wing walls would be 1 foot thick; 10 feet long; and 14 foot, 6 inches tall. The bridge would be traffic-rated for heavy farm equipment. Both sides of the bridge would have a 6-inch-tall curb affixed with removable 3-foot-tall metal guard rails along the entire bridge length. Within the armored portion of channel upstream of the bridge, a 12-foot-wide segment of the Tule Canal banks would be graded to have a slope of 5:1 to the channel bottom to allow maintenance access.

**Figure 2-4 Preliminary Design Concept for Agricultural Road Crossing 2**



Note: This graphic includes a cross-section and plan view.

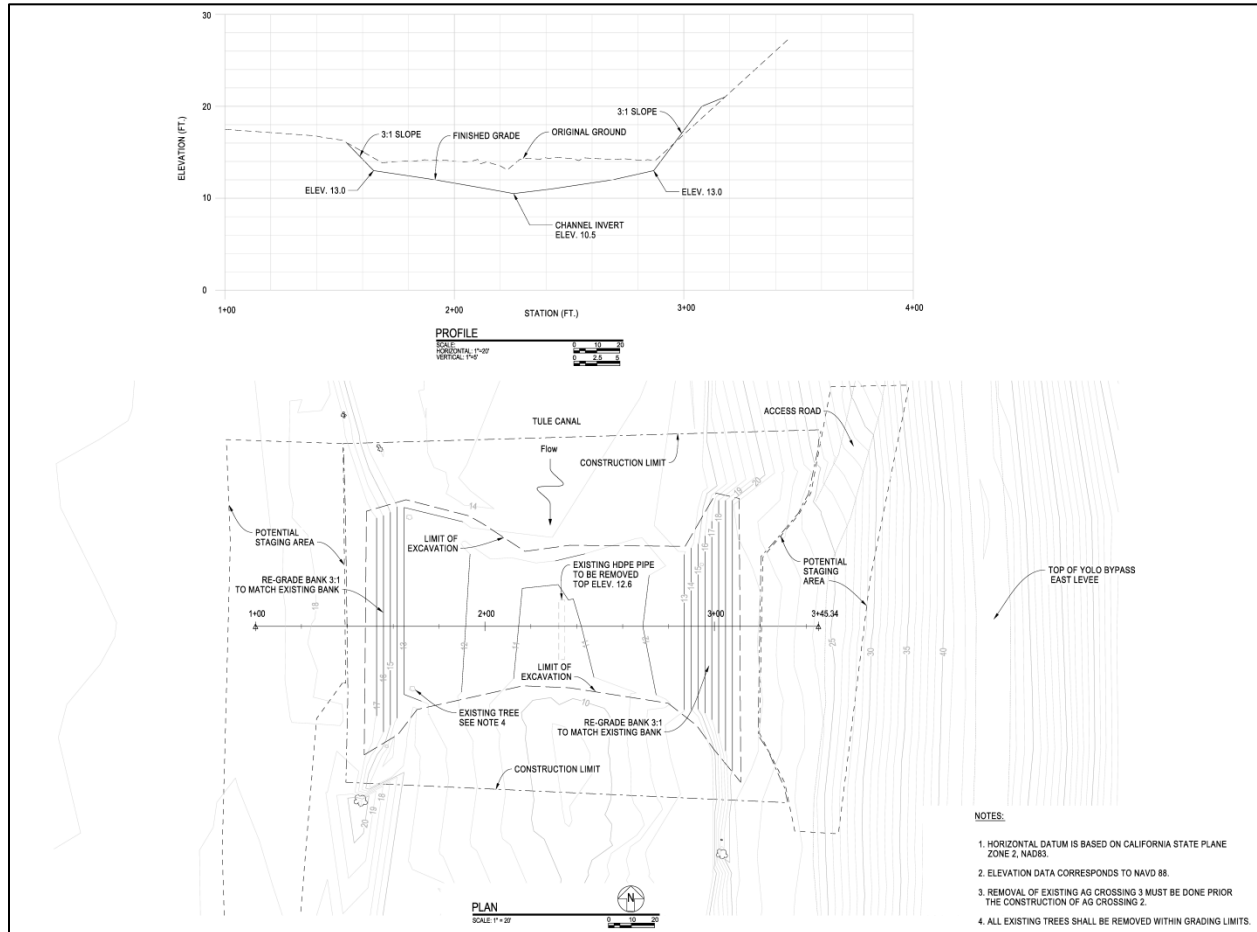
The bridge would have a bottom chord elevation of 19 feet and a top-of-deck elevation of 21.5 feet. Tule Canal, spanning from channel bank to channel bank, would be lined with engineered streambed material 35 feet upstream and downstream, and within the culverts of the new bridge, to armor this crossing. The final grade of the engineered streambed material would be 14 feet (Figure 2-4). An existing 24-inch culvert upstream of the bridge, which drains the adjacent western agricultural fields, would be replaced with a double flashboard riser to reduce sediment loading from adjacent agricultural fields.

### 2.2.1.6 Agricultural Road Crossing 3 Modification

Given the close proximity to Agricultural Road Crossing 2 and the lack of a need for a water control structure at this site, Agricultural Road Crossing 3 is considered unnecessary and would be removed.

The existing Agricultural Road Crossing 3 is at an elevation of 15.6 feet. This earthen crossing would be removed and the upstream and downstream channels adjacent to the site would be modified to create a consistent Tule Canal channel bottom profile of approximately 34.1 feet through the area (Figure 2-5).

**Figure 2-5 Preliminary Design Concept for Agricultural Road Crossing 3**



Note: This graphic shows the removal of the road crossing, which includes a cross-section and profile view.

### 2.2.2 Proposed Construction Methods

The majority of proposed construction activities are anticipated to take place between May 1 and November 1, outside of the flood season. That said, the construction start date depends on water elevations and permit acquisitions. Construction would take place during daylight hours, typically from 7:00 a.m. to 7:00 p.m., Monday through Friday. These work times may be extended into the evening or weekend during key points of the construction phase, as needed. Adjacent landowners, Yolo County, and the CDFW FWWA manager would be notified prior to the start of construction activities.

### ***2.2.2.1 Fremont Weir Fish Passage Structure Construction***

#### **2.2.2.1.1 Site Access, Mobilization, Staging**

Construction equipment and materials would be transported from Interstate 5 (I-5) to Old River Road, then north on County Road 117 and west on County Road 16 until it dead-ends at the Yolo Bypass east levee, 1.1 miles south of Fremont Weir. The project area would then be accessed by turning right on the levee road and driving through the locked gates just south of the Fremont Weir (Figure 2-6).

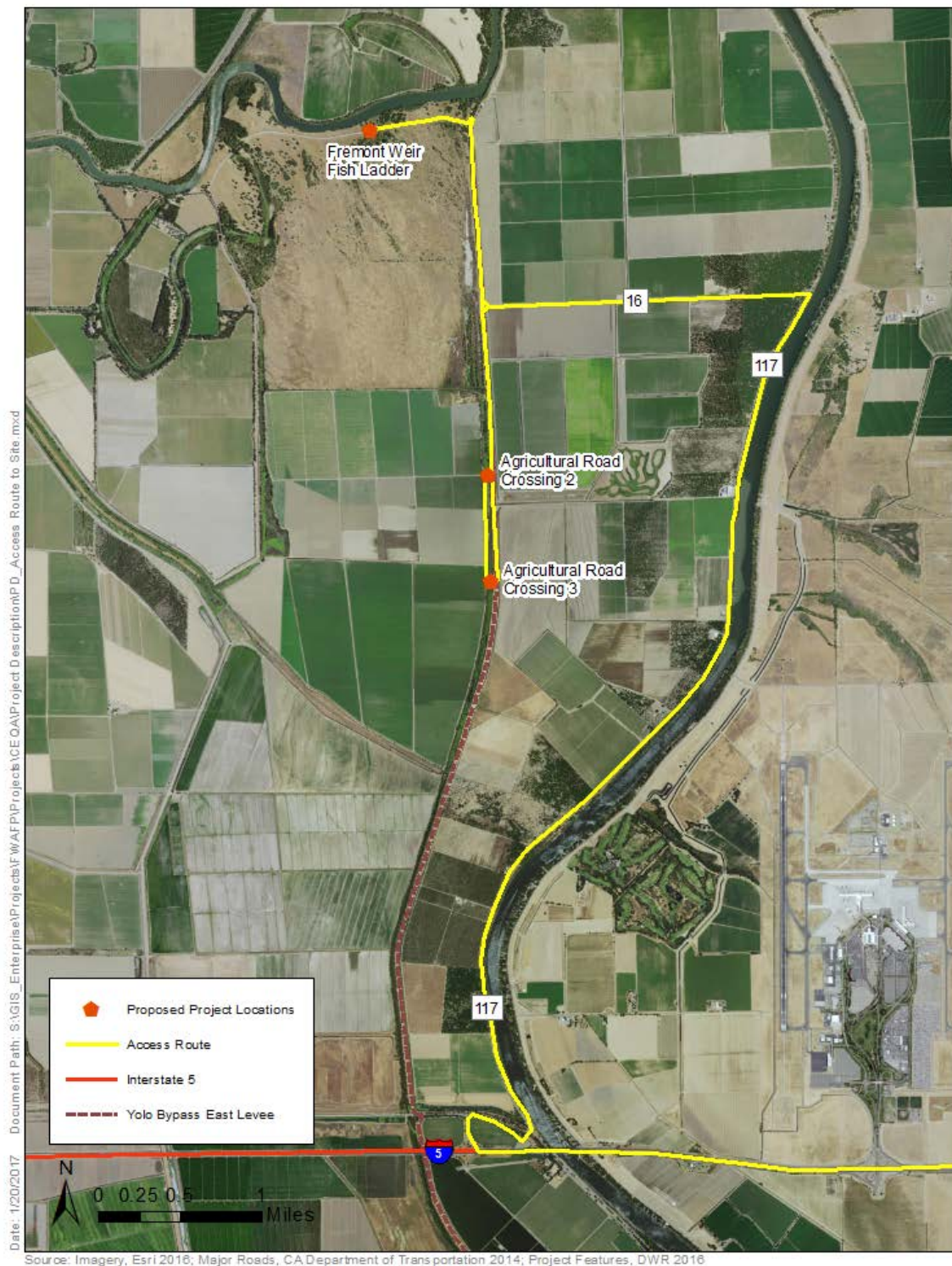
There are two access routes that parallel the Fremont Weir, both of which are situated behind locked gates on County Road 107 (300 feet apart). The northern gate can be used to access the northern earthen road that sits just north of Fremont Weir and would be used to access the Fremont Weir fish ladder and construction staging areas.

Staging areas would be cleared and grubbed. The construction footprint would also be cleared and grubbed. The construction contractor would determine if any mature trees within the construction footprint could be preserved and would provide fencing around those trees.

No public road closures would be necessary because the roads adjacent to the project area are not accessible to public vehicles. Nevertheless, the construction area would be clearly marked with construction fencing to indicate to public foot traffic that the construction area is restricted. In addition, signs would be posted near the public parking area at the south end of the FWWA to let the public know not to enter the construction area. If needed, monitors would be used to reinforce the 'no entry' signage. Lastly, CDFW would be contacted and requested to designate and identify the construction area as a "No Hunting Zone" during construction.

Based on the timing of construction, dewatering at this location is not anticipated. Still, if the area includes some wetted area, the deep pond would be pumped down to an elevation below 17 feet to allow nearby water to drain toward the deep pond. If dewatering near Fremont Weir is required, the water would be diverted downstream toward Reach 2.

**Figure 2-6 Access Route to Proposed Project Locations in the Project Area**



### **2.2.2.1.2 Construction Activities**

The existing fish ladder would be demolished and removed. The removed debris would be transported by dump truck to the Yolo County Central Landfill. In the location of the demolished fish ladder, a 36-foot by 60-foot area would be excavated approximately 9 feet in depth to an elevation of 17 feet. A 18-foot by 8-foot section within this area, on the northern side, would be excavated 3 feet deeper, for a total depth of approximately 12 feet, for the foundation key (Figure 2-2). The excavated area would be formed and concrete would be poured to create the fish passage structure.

A crane would be used to pile drive the sheet pile wall. The sheet pile wall would be installed to elevation 32 feet and would serve as a temporary weir in the event larger flows were to occur at Fremont Weir prior to the completion of construction activities. After the bottom-hinged gate was installed and operational, the sheet pile wall would be cut to the bottom of the foundation slab at elevation 19 feet.

Four 4.5-foot by 4.5-foot by 3.0-foot areas would be excavated and formed for concrete spread footings. Four 30-inch-wide steel columns would be placed in the poured concrete to support the raised 15-foot by 15-foot equipment platform. The construction footprint associated with these activities is depicted in Figure 2-7.

Approximately 975 cubic yards (cy) of material would be excavated during the construction of the fish passage structure, of which 116 cy would be reused as fill material at that location.

The remaining spoil materials would be removed and transported to either an existing agricultural field in the Elkhorn Basin, just east of the Yolo Bypass, or to an established spoil site along the oxbow on the western portion of the FWWA (referred to as Mt. Meixner) (Figure 2-8). Access to the Elkhorn Area spoil site would occur via the earthen road atop the Fremont Weir and local county roads just east of the Yolo Bypass. The landowner would stockpile the material in a location agreed on by the resource agencies and would use the material in previously disturbed agricultural fields. Access to the Mt. Meixner spoil site would occur via a temporary constructed road that would run directly south from Fremont Weir to Mt. Meixner. The route would avoid mature trees and sensitive areas identified during pre-construction surveys.

The levee roads used for construction access would be repaired to pre-project conditions, if affected by the construction of project. DWR, Reclamation, and the construction contractor would document conditions of levee roads prior to the start of construction.

### **2.2.2.2 Fremont Weir Stilling Basin Construction**

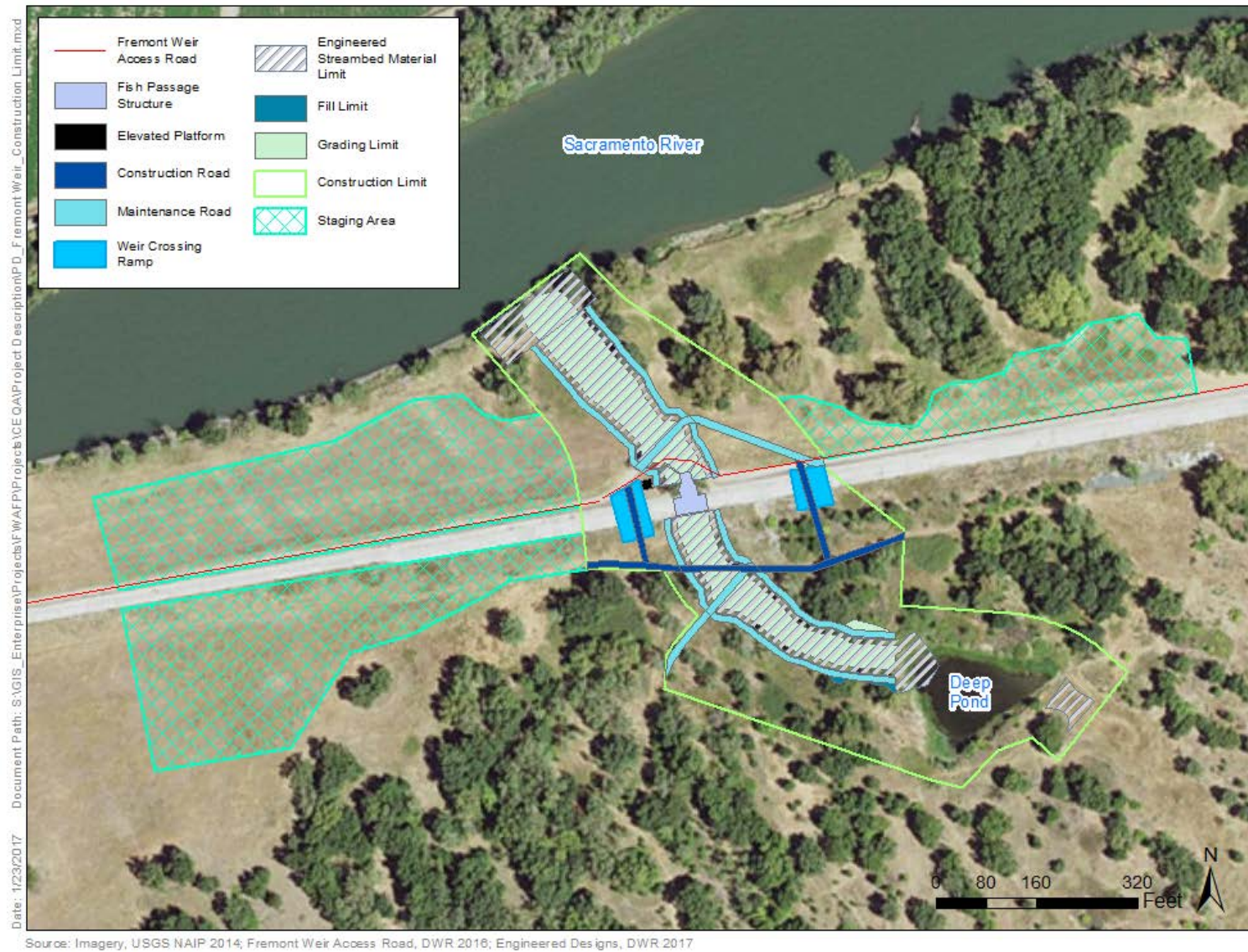
#### **2.2.2.2.1 Site Access, Mobilization, Staging**

The Fremont Weir stilling basin would be accessed along the same route as the Fremont Weir fish ladder (Figure 2-6). In addition, during construction, earthen ramps would be placed in the stilling basin to allow vehicles and equipment to access the south end of the stilling basin. Material excavated from the Upstream Channel, the fish ladder, and the stilling basin would be used to create the ramps.

The need to dewater is not anticipated, but if the channel becomes wetted, the deep pond would be pumped down to an elevation below 17 feet, as described in section 2.2.2.1.1, to allow the area to drain into the deep pond.

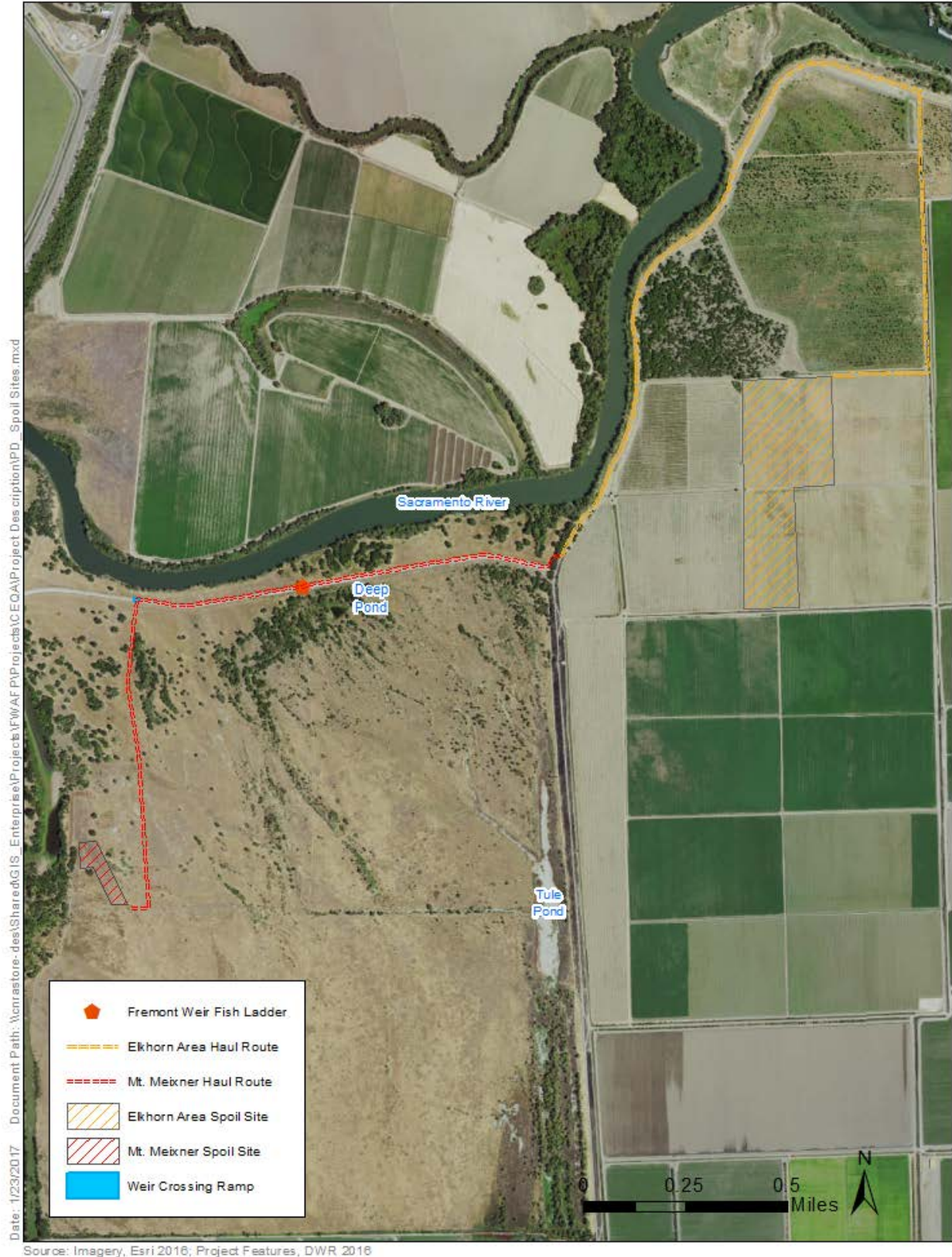


**Figure 2-7 Proposed Construction and Maintenance Footprints, Staging Areas, and Access Routes for the Upstream Channel, Fremont Weir Fish Passage Structure, and Reach 1**





**Figure 2-8 Proposed Haul Routes to the Potential Spoil Locations**



#### **2.2.2.2.2 Construction Activities**

An approximately 40-foot-wide portion of the Fremont Weir stilling basin in line with the location of the fish passage structure would be saw-cut, demolished, and removed. Approximately 175 cy of material would be removed from the fish ladder and Fremont Weir stilling basin. The removed debris would be transported by dump truck to the Yolo County Central Landfill. Once the concrete is removed, roughly 6 feet of dirt would be excavated to an elevation of 17 feet. This depth of excavation would allow for 2 feet of aggregate base and 3 feet of new concrete to be poured in place, bringing the 15-foot bottom width to invert elevation 22 feet, matching that of the fish passage structure. For the remainder of the trapezoidal channel at the stilling basin, the concrete would be formed with 3:1 side slopes to tie back into the existing concrete bottom of the stilling basin. Approximately 375 cy of concrete would be poured for the fish passage structure, Fremont Weir stilling basin, and spread footings. The construction footprint associated with these activities is included in Figure 2-7.

When construction is complete, the earthen ramps would be removed and material would be removed and transported either to an existing agricultural field in the Elkhorn Basin, just east of the Yolo Bypass, or to an established spoil site along the oxbow on the western portion of the FWWA (referred to as Mt. Meixner) (Figure 2-8).

#### **2.2.2.3 Upstream Channel Construction**

##### **2.2.2.3.1 Site Access, Mobilization, Staging**

The Upstream Channel would be accessed along the same route as the Fremont Weir fish ladder (Figure 2-6).

This site is not expected to need dewatering. If the site is wet, then it would likely mean that the Sacramento River is too high to begin construction. Because the Sacramento River is usually below 17 feet during the identified construction window, the approach to dewatering, if needed, would be to wait until the Sacramento River recedes enough to allow the site to dry.

##### **2.2.2.3.2 Construction Activities**

Material would be excavated from this channel to allow compaction of the channel section, placement of filter fabric, backfill of 1-foot-thick aggregate-base-rock slope protection, and backfill of 12-inch D100 round engineered streambed material to final grade to create a 10-foot bottom width channel with 3:1 side slopes.

Additional material would be removed near the Fremont Weir fish ladder to expand to a 5:1 side slope for the future access of maintenance vehicles. The construction footprint associated with these activities is included in Figure 2-7.

Approximately 5,404 cy of material would be excavated from this channel and would be transported either to an existing agricultural field in the Elkhorn Basin, just east of the Yolo Bypass, or to an established spoil site along the oxbow on the western portion of the FWWA (referred to as Mt. Meixner) (Figure 2-8).



#### **2.2.2.4 Reach 1 Construction**

##### **2.2.2.4.1 Site Access, Mobilization, Staging**

Reach 1 would be accessed along the same route as the Fremont Weir stilling basin, including use of the earthen ramps (Figure 2-6).

If the water surface elevation of the deep pond is greater than 17 feet, this area may be wetted at the beginning of the construction season. Still, the water surface elevation of the deep pond is typically lower than this target elevation. If the deep pond exceeds this water surface elevation, then it would be lowered through pumping and diverting water downstream toward Reach 2.

##### **2.2.2.4.2 Construction Activities**

Reach 1 would be excavated along a new alignment to a depth of 19 feet at its upstream end and to a depth of 17 feet at its downstream end. This excavation depth would allow compaction of the channel section, placement of filter fabric, backfill of 1-foot-thick aggregate-base-rock slope protection, and backfill of 1 foot of 12-inch D100 round engineered streambed material to armor the new channel. The finished channel would be 400 feet long and include a 10-foot bottom width, with 3:1 side slopes.

Excavation of this channel would include the removal of trees and existing vegetation, but would be aligned to minimize the need for removal of mature trees. The construction footprint associated with these activities is included in Figure 2-7.

Approximately 3,605 cy of material would be removed, including a portion of riprap on the downstream edge of the stilling basin. Approximately 327 cy of the excavated soil would be utilized as fill in low spots along Reach 1. The remaining 3,278 cy of material would be excavated from this channel and would be transported to an existing agricultural field in the Elkhorn Basin, just east of the Yolo Bypass, or to an established spoil site along the oxbow on the western portion of the FWWA (referred to as Mt. Meixner) (Figure 2-8).

#### **2.2.2.5 Agricultural Road Crossing 2 Construction**

##### **2.2.2.5.1 Site Access, Mobilization, Staging**

Construction equipment and materials for Agricultural Road Crossing 2 would be transported from I-5 and local roadways to the Yolo Bypass east levee road (Figure 2-6).

The construction footprint and staging areas would be cleared and grubbed. The construction contractor would determine if any of the mature trees within the construction footprint could be preserved and would provide fencing around those trees. Aquatic vegetation in the channel would be removed prior to any in-channel work and would be disposed of off-site at the Yolo County Central Landfill.

Agricultural Road Crossing 2 would potentially be surrounded by water during the proposed construction window, depending on the path landowners choose to route irrigation water. Thirty days prior to the start of construction in this area, DWR and Reclamation would ask landowners to reroute water through other irrigation canals to keep the construction area dry.

In addition, removal of Agricultural Road Crossing 3 (described in section 2.2.2.6) would improve drainage and increase the likelihood that the site would drain naturally and not require dewatering activities.

If water cannot be routed away from Agricultural Road Crossing 2, then earthen dams would be constructed with approximately 1,050 cy of clean fill material upstream and downstream of the existing crossing. Silt fencing would be used to prevent increases in turbidity downstream. The area would be drained prior to removal of the existing crossing. If needed, bypass pumping would be used to divert flow around the project area. The northern earthen dam would be constructed for access regardless of the need to dewater.

### **2.2.2.5.2 Construction Activities**

The earthen road and culverts at Agricultural Road Crossing 2 would be removed (Figure 2-4). An approximate 170-foot by 20-foot area would be excavated to an elevation of 5 feet. Approximately 530 tons of aggregate base would be placed on the bottom of the excavated area to a depth of 3 feet. A crane would be used to place each of the six 24-foot-wide precast concrete culverts on top of the aggregate base. Each culvert would likely be placed in three 6-foot-long segments. Approximately 2,200 cy of engineered streambed material would be placed within the open areas of the box culverts and 35 feet upstream and downstream of the culverts to protect this area from potential scour. Approximately 15 cy of concrete slurry would be placed in between the individual culverts, and 52 cy of concrete would be poured on top of all of the culverts to a depth of 6 inches. Approximately 35 cy of concrete would be poured to create concrete footings and wingwalls on the four corners of the crossing. Concrete would be poured on-site after dewatering activities are complete and would be allowed to cure prior to exposure to water. The construction footprint associated with these activities is included in Figure 2-9.

Approximately 4,400 cy of material, including from the earthen dams, would be excavated from this channel and would be transported either to an existing agricultural field in the Elkhorn Basin, just east of the Yolo Bypass, or to an established spoil site along the oxbow on the western portion of the FWWA (referred to as Mt. Meixner) (Figure 2-8).

The levee roads used for construction access would be repaired to pre-project conditions, if affected by the construction of the project. DWR, Reclamation, and the construction contractor would document conditions of levee roads prior to the start of construction.

**Figure 2-9 Proposed Construction Footprint and Potential Staging Area for Agricultural Road Crossing 2**



### **2.2.2.6 Agricultural Road Crossing 3 Construction**

#### **2.2.2.6.1 Site Access, Mobilization, Staging**

Agricultural Road Crossing 3 is 0.7 mile south of Agricultural Road Crossing 2, so construction access would be similar to that of Agricultural Road Crossing 2. In addition to the access route for Agricultural Road Crossing 2, an existing earthen farm road west of Tule Canal, located between Agricultural Road Crossing 2 and Agricultural Road Crossing 3, would be used to access Agricultural Road Crossing 3 (Figure 2-6).

The footprint for this construction site would be smaller than for other sites. Thirty days prior to the start of construction in this area, DWR and Reclamation would ask landowners to reroute water through other irrigation canals to keep the construction area dry. Dewatering, if needed, would consist of placing sandbags across the channel, adjacent to the toe of the crossing, to isolate the area from water in the Tule Canal. The area would be pumped dry and an effort would be made to keep it dry for 15 days after dewatering. If groundwater infiltration makes it difficult to keep the site dry, then biological monitors would work closely with the construction crew during crossing removal.

Aquatic vegetation in the channel would be removed prior to any in-channel work and would be disposed of off-site at the Yolo County Central Landfill.

#### **2.2.2.6.2 Construction Activities**

The earthen berm crossing would be removed and regraded to create a consistent, uniform channel. The construction footprint associated with these activities is included in Figure 2-10.

The approximately 1,000 cy of material that would be removed from Agricultural Road Crossing 3 would be transported either to an existing agricultural field in the Elkhorn Basin, just east of the Yolo Bypass, or to an established spoil site along the oxbow on the western portion of the FWWA (referred to as Mt. Meixner) (Figure 2-8).

### **2.2.3 Operation and Maintenance**

#### **2.2.3.1 Fremont Weir Fish Passage Structure Operation and Maintenance**

The fish passage structure would incorporate a bottom-hinged gate to allow the structure to be closed, as necessary, for maintenance, repairs, or any other reason at any time. Stoplogs would be added to the concrete gate housing to enable maintenance of the bottom-hinged gate. The fish passage structure would operate in conjunction with any Fremont Weir overtopping event that may occur between November 1 and May 31. During the dry season, when the river water surface elevation is below 22 feet, the gate would be left in the down position to reduce the risk of vandalism.

The gated structure would be opened following a Fremont Weir overtopping event once the Sacramento River reaches a stage of 32.3 feet, at the location of the new structure. This stage would allow for a flow depth of 0.5 foot over the weir and the resulting flow into the Yolo Bypass would reduce scour velocities through the fish passage structure because of the higher tailwater conditions downstream.



**Figure 2-10 Proposed Construction Footprint and Potential Staging Areas  
for Agricultural Road Crossing 3**



Three scenarios to operate the fish passage structure once it is opened were considered.

- Scenario 1: The fish passage structure remains open until the Upstream Channel no longer receives water from the river at a stage of 22 feet.
- Scenario 2: The fish passage structure remains open for three days after Fremont Weir stops overtopping.
- Scenario 3: The fish passage structure remains open for one day after Fremont Weir stops overtopping and reopens when the river stage falls below 27 feet and closes when the river stage reaches 24 feet, for no longer than five days.

Modeling results indicated a slight increase in inundation within the Yolo Bypass for Scenario 1 (refer to Figure 3.10-2 in section 3.10, “Hydrology and Water Quality”). Additionally, there was uncertainty regarding fish passage conditions when the flow through the structure had a depth of less than 3 feet. Modeling results for Scenarios 2 and 3 indicated no significant changes in Yolo Bypass drainage and inundation patterns (refer to Figure 3.10-1 through Figure 3.10-3 in section 3.10, “Hydrology and Water Quality”). Because of the inundation increase and fish passage uncertainty inherent in Scenario 1, the proposed project would only implement Scenario 2 or Scenario 3.

Initially, Scenario 2 would be operated and evaluated for performance. If fish remain stranded in the vicinity of the project area following overtopping events, Scenario 3 would be operated for future overtopping events and would undergo evaluation for stranded fish. The scenario that tends to perform the best would continue to be used (see Appendix B for a description of the Post-Construction Monitoring Evaluation and Adaptive Management Plan).

If an overtopping event is brief or minor, fish would be unlikely to access to the project location. Operating the fish passage structure during smaller events may add risk to migratory fish because of the lower Sacramento River stages associated with minor overtopping events. CDFW, NMFS, DWR, and Reclamation would work together to determine the relative risk to migratory fish and decide if the structure should be opened during each overtopping event.

The fish passage structure would be monitored regularly during operation. When it was safe to access the fish passage structure, presumably when Fremont Weir was not overtopping, any debris that had become lodged in the box culvert or gate would be cleared. In addition, after each gate operating cycle when the river stage receded below the channel invert, the gate would be inspected and cleared of debris.

Outside of the flood season, routine maintenance would be performed at the fish passage structure. Maintenance of the gate would include washing the steel components to reduce corrosion, applying erosion coating, inspecting the air bladder and repairing leaks or tears, inspecting air compressor components, and torquing main anchor bolts once in the spring and once in the fall, or as needed. Maintenance of the raised equipment platform would include cleaning exterior and interior equipment and cabinets of dust and debris; checking tightness of screws and bolts and tightening as needed; and inspecting and replacing batteries, solar panels, and the inverter. The concrete at the fish passage structure would be cleared of debris and sediment and inspected and repaired for cracking, scaling, or spalling. The sheet piles would be inspected and repaired for misalignment to insure no interlock separation, holes, cracks, or dents.



### ***2.2.3.2 Fremont Weir Stilling Basin Maintenance***

The location of the fish passage structure would become the deepest portion of the Fremont Weir stilling basin. As such, it would likely accumulate a small amount of sediment, less than 10 cy, following a Fremont Weir overtopping event. The accumulated sediment would be removed outside of the flood season, when operation of the fish passage structure would not be necessary until the next overtopping event.

### ***2.2.3.3 Upstream Channel Maintenance***

The Upstream Channel configuration would be maintained outside of the flood season by mowing vegetation, preventing trees from growing through the project channel, and removing sediment to preserve performance. Sediment deposition is anticipated to occur following overtopping events, and up to 520 cy of sediment may be removed annually. This sediment would be placed in low points created by scour within Reach 1 or disposed of at the Yolo County Central Landfill. The channel would also be inspected each year for areas of potential scour in the engineered streambed material. Additional engineered streambed material would be placed, as needed. Lastly, any large debris would be removed from the channel.

### ***2.2.3.4 Reach 1 Maintenance***

The Reach 1 configuration would be maintained outside of the flood season by preventing large trees from growing through the project channel and removing sediment to preserve performance. As much as 520 cy of sediment might be removed annually. This sediment would be placed in low points created by scour within Reach 1 or disposed of at the Yolo County Central Landfill. The channel would also be inspected each year for areas of potential scour in the engineered streambed material. Additional streambed material would be placed, as needed. Lastly, any large debris would be removed from the channel.

### ***2.2.3.5 Agricultural Road Crossing 2 Maintenance***

Because the hydraulic capacity of Agricultural Road Crossing 2 would be increased to more closely match that of the Tule Canal by replacing the earthen road crossing with a series of 24-foot-wide culverts, maintenance is expected to be low.

After Fremont Weir overtopping events and prior to the irrigation season for agriculture, the crossing would be inspected and any debris would be removed from the culvert openings. If the engineered streambed material near the site begins to erode, the material would be replaced.

## **2.2.4 Anticipated Construction Equipment**

Throughout the entire project area, an estimated 30 construction personnel and three construction supervisors would be on-site daily during construction of the proposed project. Private worker vehicles would be parked within the staging areas or on top of the levee road where the levee is in close proximity to the construction footprint.

It is anticipated that the needed construction equipment would consist of the following:

- Excavator — 3 per day, 50 days.
- Crane — 3 per day, 7 days.
- Grader and roller — 3 per day, 10 days.
- Dozer — 3 per day, 40 days.

## 2.0 Description of the Proposed Project and No-Action Alternative

- Tractor/Loader/Backhoe — 3 per day, 45 days.
- Water truck — 5 per day, 75 days.
- Other equipment (e.g., chain saw) — 1 per day, 6 days.
- Compressor — 6 per day, 6 days.
- Generator — 5 per day, 75 days.

It is anticipated that operation would require the use of a light-duty truck or trucks. It is anticipated that maintenance equipment could consist of an excavator, loader, dozer, dump truck, and mower, depending on the type of maintenance that needs to be performed.



### 3.0 Environmental Setting, Discussion of Impacts, and Mitigation Measures

This chapter describes the environmental setting of the project area, the regulatory setting for each of the resources that may be affected by the proposed project, and a discussion of the potential environmental impacts associated with the proposed project and the No-Action Alternative.

The environmental setting for each resource describes the existing conditions when preparation of the IS/EA began. The environmental baseline for the proposed project is April 2016.

For each resource, there is a discussion of the potential environmental impacts associated with construction, operation, and maintenance of the proposed project. Potential direct and indirect effects (impacts) of the proposed project are analyzed in accordance with 40 CFR 1508.8. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action but are later in time or farther removed in distance. The IS/EA analyzes the direct and indirect effects for each resource, but does not specifically differentiate between direct and indirect. In addition to being analyzed for each resource section, direct and indirect effects are analyzed in Chapter 4.0, “Cumulative Impacts”.

CEQA Guidelines Appendix G was used as the basis for assessing the significance of potential environmental impacts, taking into account the whole of the action as required by CEQA. Agency standards, regulatory requirements, and professional judgement were also used, where appropriate. For the purposes of NEPA, the context and intensity of the significance of potential project effects was taken into consideration.

Each of the resources was evaluated and one of the following determinations was made to describe the level of significance of impacts:

- **No Impact.** No impact on the environment would occur as a result of implementing the project.
- **Less than Significant.** Implementation of the project would not result in a substantial and adverse change to the environment and no mitigation would be required.
- **Less than Significant with Mitigation Incorporated.** Implementation of the project could result in a substantial, or potentially substantial, adverse change to the environment, but incorporation of identified mitigation measures would reduce the impact to a less-than-significant level.
- **Significant and Unavoidable.** Implementation of the project could result in an impact that has a substantial, or potentially substantial, adverse change to the environment and mitigation to reduce the impact to a less-than-significant level is not possible.

Mitigation measures are provided to reduce potentially significant impacts to less-than-significant levels, where applicable. A summary of mitigation measures is included in Appendix C, “Mitigation Monitoring and Reporting Program.”

### 3.1 Resources Eliminated from Further Analysis

Several resources were eliminated from detailed analysis because no impacts from project implementation are anticipated. A description of the resources and an explanation for eliminating them from further analysis are provided in this section.

#### 3.1.1 Environmental Justice

Executive Order 12898 (February 11, 1994) requires each federal agency to identify and address disproportionately high and adverse human health or environmental impacts. This includes social and economic effects of the agency's program, policies, and activities on minority populations and low-income populations. There is no residential population within the project area. Additionally, the proposed project would not result in changes to agricultural operations that could affect farmworkers, which can include minority and low-income populations. The proposed project would not result in any adverse human health or environmental impacts on minority or low-income populations. For these reasons, environmental justice is eliminated from further analysis.

#### 3.1.2 Growth-Inducing Impacts

The agricultural lands within the project area are undeveloped. The proposed project would not establish new housing or businesses in the project area and would not improve access routes. The proposed modifications to the existing fish ladder, scour channels, and agricultural road crossings would not remove obstacles to population growth or encourage economic growth. For these reasons, growth inducement is eliminated from further analysis.

#### 3.1.3 Indian Sacred Sites

Sacred sites are defined in Executive Order 13007 (May 24, 1996) as "any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site." There are no federally owned lands within the project area, so no Indian Sacred Sites, as defined in Executive Order 13007, are present within the project area. For this reason, Indian sacred sites are eliminated from further analysis.

#### 3.1.4 Indian Trust Assets

Indian trust assets (ITAs) are legal interests in assets that are held in trust by the United States for federally recognized Indian tribes or individuals. There are no Indian reservations, rancherias, or allotments in the project area. The nearest ITA is the United Auburn Community of the Auburn Rancheria, which is approximately 20 miles north-northeast of the project area. The proposed action does not have a potential to affect ITAs. For this reason, ITAs are eliminated from further analysis.

#### 3.1.5 Land Use and Planning

There are no established communities within the project area. Land use within and surrounding the project area is designated by Yolo County as Agriculture (County of Yolo 2009). The proposed modifications to the existing fish ladder, scour channels, and agricultural road crossings would not change

land use, would not divide an established community, and would not conflict with the *2030 Countywide General Plan* (County of Yolo 2009) or the draft *Yolo Habitat Conservation Plan and Natural Community Conservation Plan* (Yolo County Habitat Conservation Plan/Natural Community Conservation Plan Joint Powers Agency 2015). The proposed project would have no impact on land use and planning, so this resource topic is eliminated from further analysis.

#### 3.1.6 Mineral Resources

The primary mineral resources in Yolo County are mined aggregate and natural gas (County of Yolo 2009). There are no designated mineral resource zones in, or near, the project area. Natural gas fields do exist within some areas of the Yolo Bypass, but the proposed modifications to the existing fish ladder, scour channels, and agricultural road crossings would not affect the gas fields and would not result in the loss of availability of this mineral resource. The proposed project would have no impact on mineral resources, so this resource topic is eliminated from further analysis.

#### 3.1.7 Population and Housing

There are no existing homes within the project area, and the proposed project does not include the construction of new homes or other growth-inducing infrastructure. The proposed modifications to the existing fish ladder, scour channels, and agricultural road crossings would not displace homes or people, or result in the need for replacement housing elsewhere. Construction activities would provide only temporary employment opportunities, so there would not be a need for additional housing. For these reasons, the population and housing resource topic is eliminated from further analysis.

#### 3.1.8 Public Services

There are no schools or parks within the project area. The Fremont Weir Wildlife Area is located within the project area, but this area does not offer governmental facilities or service. Fire protection within the project area is provided by the Elkhorn Fire Protection District, and law enforcement is provided by the Yolo County Sheriff's Department (County of Yolo 2009). The proposed project modifications and associated temporary increase in construction vehicles on local roads would not interfere with emergency access, and would not prevent fire protection or law enforcement personnel from maintaining acceptable service ratios or response times in the vicinity of the project area. Therefore, no new governmental facilities or expansion of existing facilities would be required to maintain these performance objectives and there would be no environmental impact. For these reasons, the public services resource topic is eliminated from further analysis.

#### 3.1.9 Socioeconomics

Agricultural production would not be adversely affected during proposed project construction or operation (refer to section 3.3, "Agricultural and Forest Resources"), and the construction of a permanent agricultural road crossing and removal of a second road crossing would eliminate the expense of rebuilding and maintaining the road crossings annually. Construction workers may increase revenue at local lodging, restaurants, or other businesses, but any increase would be temporary and would not have an adverse effect on socioeconomics. The Fremont Weir Wildlife Area does not charge use fees, so no revenue would be lost as a result of closures during the temporary construction period. For these reasons, the socioeconomics resource topic is eliminated from further analysis.



## 3.2 Aesthetics

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

### 3.2.1 Affected Environment

Aesthetic resources are the visual setting and character of an area. The scenic character of the project area is defined by the Sacramento River, the Fremont Weir Wildlife Area (FWWA), and agricultural fields (refer to Figure 1-1 and Figure 1-3 in Chapter 1.0, "Introduction"). The channel extending from Fremont Weir to the Sacramento River (Upstream Channel) is lined with grasses and herbaceous vegetation viewable by river recreationists and recreationists utilizing the FWWA. Fremont Weir is a solid concrete structure that spans 1.8 miles and includes a fish ladder near its eastern end. The channel extending from Fremont Weir to the deep pond (Reach 1) is surrounded by trees and shrubs with some open grassland areas. These channels and the weir are viewable by recreationists walking around the FWWA; however, vegetation can block the view of these features, depending on the location of the viewer.

Mt. Meixner is an approximately 8-acre established spoil site located within the western portion of the FWWA. The spoil site is approximately 1,500 feet long, 25 feet tall, and 300 feet at its widest point. The spoil site has vegetated side slopes and is viewable by recreationists walking within the FWWA. Vegetation can block the view of this site, depending on the location of the viewer.

The Elkhorn Area (an area within the northern Elkhorn Basin) is located on the east side of the Yolo Bypass east levee. The area consists of agricultural fields that are viewable from the surrounding levee road, which is located behind locked gates and only accessible to recreationists walking along the levee.

Existing structures within the agricultural fields include culverts running through and/or adjacent to the agricultural road crossings. The agricultural fields are located on private land and are viewable only by the landowners and their personnel.

The portion of the Sacramento River that is adjacent to the Fremont Weir Wildlife Area is not designated as a California or National Wild and Scenic River (County of Yolo 2009; National Wild and Scenic Rivers System 2016). There are no designated federal or State scenic highways within or adjacent to the project area. Old River Road and County Roads 16 and 117 are designated as local scenic roadways by Yolo County (County of Yolo 2009). Vegetation and the levee block views of the project area from these roads.

#### 3.2.2 Regulatory Setting

##### 3.2.2.1 Federal

###### *Wild and Scenic Rivers Act*

The Wild and Scenic Rivers Act of 1968 (Public Law 90-542; 16 United States Code 1271 et seq.) established the National Wild and Scenic Rivers System. The National Wild and Scenic Rivers System was created to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing (free of impoundments) condition for the enjoyment of present and future generations. The Wild and Scenic Rivers Act prohibits federal support for actions that would harm a designated river's free-flowing condition, water quality, or outstanding resource values.

###### *National Scenic Byways Program*

The National Scenic Byways Program was established under the Intermodal Surface Transportation Efficiency Act of 1991 to help recognize, preserve, and enhance selected roads throughout the United States.

##### 3.2.2.2 State

###### *California Wild and Scenic Rivers Act*

The California Wild and Scenic Rivers Act of 1972 was passed to protect designated rivers that possess extraordinary scenic, recreation, fishery, or wildlife values in their free-flowing state, together with their immediate environments, for the benefit and enjoyment of the people of the state. The California Wild and Scenic Rivers Act prohibits the construction of any water-impoundment facility on any river included in the system. It also prohibits any department within State government from assisting or cooperating in the planning or construction of any water-impoundment facility that could adversely affect the free-flowing condition and natural character of a designated river or segment of river.

###### *California Scenic Highway Program*

The California Scenic Highway Program (Streets and Highway Code Section 260) was created in 1963 to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways.

### 3.2.2.3 Local

#### *County of Yolo 2030 Countywide General Plan*

The Land Use and Community Character Element of the Yolo County General Plan (County of Yolo 2009) includes land use policies intended to ensure that the rural character of Yolo County is protected. Policy CC-1.12 relates to scenic roadways or scenic highways:

Preserve and enhance the scenic quality of the County's rural roadway system.  
Prohibit projects and activities that would obscure, detract from, or negatively affect the quality of views from designated scenic roadways or scenic highways.

Policy CC-1.2 relates to rural landscapes:

Preserve and enhance the rural landscape as an important scenic feature of the County.

### 3.2.3 Environmental Effects

#### 3.2.3.1 No-Action Alternative

Under the No-Action Alternative, no modifications would be made and no impacts on the visual character of the project area would occur.

#### 3.2.3.2 Proposed Project Alternative

Operation and maintenance of the proposed project would be similar to existing conditions and would not adversely affect the aesthetics of the project area. Thus, project operation and maintenance are not discussed further for this resource.

*a) Have a substantial adverse effect on a scenic vista? — and —*

*c) Substantially degrade the existing visual character or quality of the site and its surroundings?*

**Less than Significant.** Modification of the existing fish ladder and agricultural road crossings would occur at the same location as the existing structures, and the modified structures would be the same approximate height as the existing structures. The proposed modifications would not obstruct existing views of the agricultural fields or the Fremont Weir Wildlife Area. Fish ladder modifications would consist of replacing existing concrete with new concrete, and would not degrade the visual character of Fremont Weir. Road crossing modifications would consist of removing one road crossing and replacing an earthen road with box culverts. The concrete of the box culverts would be consistent with the agricultural setting and would not degrade the visual character of the area. Widening the Upstream Channel and Reach 1 would consist of removing any existing vegetation and lining the channels with engineered streambed material. The streambed material would be different from the existing vegetation, but would be low in height, would be similar to the existing rock material along the edge of the Fremont Weir stilling basin, and would not substantially degrade the visual character of the Fremont Weir Wildlife Area.

A new equipment housing platform would be constructed upstream of the Fremont Weir fish ladder. The steel platform would be 15 feet square and elevated 15 feet above ground. Because of tree-lined river banks, elevational differences, and distance, the platform would not be viewable from the Sacramento

River. The platform also would not be viewable from within most of the FWWA because of large stands of trees south of the platform. The platform would only be viewable by recreationists accessing the FWWA via the northern access road, which is situated behind locked gates. Views would be temporary while approaching the platform and would not substantially degrade the visual character of the surrounding area.

Spoils from sediment removal would be disposed of at either the existing Mt. Meixner spoil site or in the Elkhorn Area (an area within the northern Elkhorn Basin). The amount of material that would be spoiled would not significantly increase the size or height of Mt. Meixner, and would be spread over a large area in the Elkhorn Area. Both spoil sites would therefore be similar in appearance to existing conditions, and the visual character of the surrounding area would not be substantially degraded.

The proposed project would have a less-than-significant impact on scenic views or the visual character of the project area.

*b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?*

**Less than Significant.** Some vegetation removal would occur within the proposed staging areas, but the disturbance would be temporary and the areas would be re-planted with a weed-free native seed mix following completion of construction. Additional vegetation removal, consisting mostly of grasses, would occur within the areas proposed for channel widening, and two trees would be removed at the fish ladder location. The amount of vegetation removed would be minimal compared with the amount of existing vegetation in the project area and would not substantially damage this scenic resource. In addition, the project area is not viewable from a designated scenic highway. The proposed project would have a less-than-significant impact on scenic resources within the project area.

*d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?*

**Less than Significant.** The proposed project does not include any permanent light sources. Construction activities are anticipated to occur during daylight hours, typically between the hours of 7:00 a.m. and 7:00 p.m. But work may extend into the evening during key points of the construction phase. Evening work would require the use of portable construction lighting that would create a new source of nighttime light within the project area. Nonetheless, no residents or recreationists would have views of the construction sites at night. Motorists may have views of the light from adjacent roadways, but views would be brief and would be limited by existing vegetation between the project area and adjacent roadways. In addition, construction activities would be temporary. Thus, intermittent new sources of nighttime light during construction would not be substantial and would not adversely affect nighttime views in the surrounding area. Impacts would be less than significant.

The new materials used to modify the existing structures would include concrete, metal, and engineered streambed material. Those materials are consistent with the existing materials in the project area, but could create a temporary new source of daytime glare resulting from the reflectivity of the new material. The new materials would be exposed to the environment and subject to weathering, however, which would reduce their reflectivity. Thus, these materials would not create a source of substantial glare and would not adversely affect daytime views in the area. Impacts would be less than significant.

### 3.3 Agricultural and Forest Resources

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>II. Agricultural and Forest Resources.</b>				
<p>In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997, as updated) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts on forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.</p>				
Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### 3.3.1 Affected Environment

The project area is located in unincorporated Yolo County, within the Fremont Weir Wildlife Area (FWWA), at two agricultural road crossings along Tule Canal (which runs along the east edge of the Yolo Bypass), and in the adjacent Elkhorn Area (an area within the northern Elkhorn Basin), which is located east of the Yolo Bypass east levee. The lands within the FWWA are zoned as Agriculture by Yolo County and designated as Grazing Land by the California Department of Conservation (County of Yolo 2014; California Department of Conservation 2015). The lands west of the agricultural road crossings in the Tule Canal are designated as Unique Farmland and are also contracted under the California Land Conservation Act of 1965 (Williamson Act) (California Department of Conservation 2012). The primary purpose of the agricultural road crossings is to provide vehicle access across the Tule Canal to agricultural fields within the Yolo Bypass. There are no forestry resources in, or near, the project area. The lands in the Elkhorn Area are designated as Prime Farmland and are also contracted under the Williamson Act (California Department of Conservation 2012, 2015).

### 3.3.2 Regulatory Setting

#### 3.3.2.1 Federal

There are no federal plans, policies, or regulations related to agricultural and forest resources that are applicable to the proposed project.

#### 3.3.2.2 State

The following are the State land use and agriculture regulations that may apply to implementation of the proposed project.

##### *Farmland Mapping and Monitoring Program*

The Farmland Mapping and Monitoring Program (FMMP) provides maps and statistical data for analyzing potential impacts on agricultural resources within California. Agricultural land is rated according to soil quality and irrigation status. The FMMP updates maps every two years based on aerial imagery, public input, and field reconnaissance. Prime Farmland, Unique Farmland, and Farmland of Statewide Importance are the farmland types that need to be assessed for potential land-use change.

##### *Williamson Act*

The Williamson Act enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agriculture or related open-space use (California Department of Conservation 2015). The act creates an arrangement whereby private landowners agree with counties and cities to voluntarily restrict land to agricultural and open-space uses. The vehicle for these agreements is a rolling term contract. The minimum initial contract term is 10 years.

#### 3.3.2.3 Local

##### *County of Yolo 2030 Countywide General Plan*

The Agricultural and Economic Development Element of the Yolo County General Plan (County of Yolo 2009) sets forth the following policies and goals to support and sustain agriculture, which is the primary economic driver in Yolo County:



**Goal AG-1: Preservation of Agriculture. Preserve and defend agriculture as fundamental to the identity of Yolo County.**

Policy AG-1.5: Strongly discourage the conversion of agricultural land for other uses. No lands shall be considered for redesignation from Agricultural or Open Space to another land use designation unless all of the following findings can be made:

- A. There is a public need or net community benefit derived from the conversion of the land that outweighs the need to protect the land for long-term agricultural use.
- B. There are no feasible alternative locations for the proposed project that are either designated for non-agricultural land uses or are less productive agricultural lands.
- C. The use would not have a significant adverse effect on existing or potential agricultural activities on surrounding lands designated Agriculture.

Policy AG-1.6: Continue to mitigate at a ratio of no less than 1:1 the conversion of farm land and/or the conversion of land designated or zoned for agriculture, to other uses.

Policy AG-1.18: When undertaking improvement of public roadways and drainage facilities, consult with adjoining farmland owners and incorporate designs that minimize impacts on agriculture.

**Goal AG-2: Natural Resources for Agriculture. Protect the natural resources needed to ensure that agriculture remains an essential part of Yolo County's future.**

Policy AG-2.3: Work proactively with regional and watershed-based groups to protect and preserve Yolo County's agricultural water supply.

### 3.3.3 Environmental Effects

#### 3.3.3.1 No-Action Alternative

Under the No-Action Alternative, the existing fish passage structure at Fremont Weir would not be modified and no improvements would be made to the agricultural road crossings. No impacts on agricultural or forest land would occur.

#### 3.3.3.2 Proposed Project Alternative

Maintenance of the proposed project would be similar to existing conditions and would not adversely affect agricultural resources in the project area. Thus, project maintenance is not discussed further for this resource.

*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? — and —*

*e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?*

**No Impact.** No project-related construction would occur on land designated as Prime Farmland or Farmland of Statewide Importance. Lands designated as Unique Farmland occur immediately west of the agricultural road crossings; small areas of this land would be used as temporary staging areas during project construction. The land would be returned to agricultural use when construction is complete. If spoil material from construction is relocated to the Elkhorn Area, it would be placed on lands designated as Prime Farmland and used to enhance agricultural production. During operation of the proposed project, up to an approximate 1,100 cfs would flow through the fish passage structure. This potential increase in flow associated with the project would not alter the frequency, magnitude, or footprint of inundation in the Yolo Bypass (refer to Figures 3.10-1 through 3.10-3 in section 3.10, “Hydrology and Water Quality”) and thus would not result in changes to, or impacts on, growing conditions in the Yolo Bypass. Therefore, the proposed project would not convert Prime Farmland or Unique Farmland to non-agricultural uses. There would be no impact on such lands.

*b) Conflict with existing zoning for agricultural use or a Williamson Act contract?*

**Less than Significant.** The FWWA is zoned for agriculture, and the FMMP classifies the land as bearing vegetation suitable for grazing. Although improvement of the fish passage structure and the channels would result in the loss of up to 1.5 acres of land that might be used for grazing, it would not conflict with existing zoning because the FWWA would remain as suitable for grazing as it is now. Similarly, if the Mt. Meixner site is used for disposal of spoil material, the FWWA would remain as suitable for grazing as it is now. Construction of the agricultural road crossings would not conflict with the existing agricultural zoning or any Williamson Act contracts because it would not cause the permanent loss of any farmland, would not interfere with agricultural uses, and would benefit farming by providing more reliable access across the Tule Canal. If the Elkhorn Area is used for disposal of spoil material, the material would be used to enhance agricultural production and no conflict with agricultural zoning or Williamson Act contracts would occur.

Despite the minimal loss of up to 1.5 acres of land potentially suitable for grazing, the proposed project would not conflict with zoning, nor require the withdrawal of any lands from Williamson Act contracts. Impacts would be less than significant.

*c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?*

**No Impact.** No forests or timberlands exist within the project area. There would be no impact.

*d) Result in the loss of forest land or conversion of forest land to non-forest use?*

**No Impact.** Forestlands do not occur within the project area. There would be no impact.

### 3.4 Air Quality

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>III. Air Quality.</b>				
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied on to make the following determinations.				
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

#### 3.4.1 Affected Environment

This section analyzes the proposed project's impacts related to air quality. It describes existing air quality conditions in the project area, identifies sensitive land uses, and summarizes the regulatory framework for air quality management in California and the region. Air-quality-related environmental impacts are discussed and mitigation measures are proposed. Refer to section 3.8, "Greenhouse Gas Emissions," for an analysis of project-related greenhouse gas emissions.

The primary factors determining air quality are the location of air pollutant sources and the level of pollutants that they emit. Topography and meteorology also influence air quality. Physical features of the landscape along with atmospheric conditions, such as wind speed, wind direction, and air temperature gradients, determine the movement and distribution of air pollutants.

The proposed project is located in Yolo County, which is in the Sacramento Valley Air Basin (SVAB). The SVAB includes all of Shasta, Tehama, Glenn, Colusa, Butte, Sutter, Yuba, Sacramento, and Yolo counties, the western portion of Placer County, and the northeastern half of Solano County.

The Mediterranean climate of the SVAB is characterized by hot, dry summers and mild, rainy winters. Temperatures can range from 20 to 115 degrees Fahrenheit, with summer highs usually in the 90s and winter lows occasionally below freezing. Average annual rainfall is about 20 inches, the majority of which occurs in the rainy season, generally from November through March. Prevailing winds vary from moist, clean breezes from the south to dry-land flows from the north and are moderate in strength.

The SVAB is bounded by the North Coast Ranges on the west side and the Northern Sierra Nevada on the east. The valley between these mountain ranges is relatively flat. The mountains surrounding the SVAB create a barrier to air flow, which under certain meteorological conditions can trap air pollutants. When large high-pressure cells lie over the Sacramento Valley, air stagnation can occur. The highest frequency of air stagnation occurs in autumn and early winter. Reduced surface heating during this period results in a lack of surface wind and reduced vertical flow. These conditions allow air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with temperature inversions (warm air on top of cooler air) that trap pollutants near the ground.

In the Sacramento Valley, the ozone season, from May through October, is characterized by stagnant morning air or light winds with the delta sea breeze arriving in the afternoon from the southwest. This evening breeze typically transports air pollutants to the north, out of the Sacramento Valley. But, on about half of the days from July to September, a phenomenon called the “Schultz Eddy” prevents this from occurring. This eddy causes the wind pattern to circle back to the south, keeping air pollutants in the valley, rather than allowing wind patterns to move north and carry air pollutants out. This phenomenon can exacerbate pollution levels and increase the likelihood of violating air quality standards. The eddy typically dissipates about midday, when the delta sea breeze arrives.

#### **3.4.1.1 Existing Air Quality Conditions**

The United States Environmental Protection Agency (EPA) and California Air Resources Board (CARB) have established ambient air quality standards for six “criteria pollutants,” pursuant to the federal Clean Air Act of 1970 and the California Clean Air Act, respectively. The criteria pollutants are ozone, carbon monoxide, nitrogen dioxide, particulate matter less than 2.5 microns in aerodynamic diameter (PM<sub>2.5</sub>), particulate matter less than 10 microns in aerodynamic diameter (PM<sub>10</sub>), sulfur dioxide, and lead (United States Environmental Protection Agency 2016a). CARB oversees standards maintenance for three additional pollutants: hydrogen sulfide, sulfates, and visibility-reducing particles.

Existing air-quality conditions in the project area are characterized by comparing the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) for these pollutants with monitoring data collected in the region. Table 3.4-1 lists the NAAQS and CAAQS.

The Woodland-Gibson Road monitoring station, located approximately 10 miles southwest of the project area, was used to describe existing conditions in the project area. Pollutant concentrations measured at the Woodland-Gibson Road monitoring station are presented in Table 3.4-2. From 2013 through 2015, air quality at this monitoring station exceeded the State standards for 8-hour average ozone and PM<sub>10</sub>.

**Table 3.4-1 National and State Ambient Air Quality Standards.**

Pollutant	Averaging Time	National Standards <sup>a</sup>		California Standards
		Primary	Secondary	
Carbon monoxide	8 Hour	9 ppm	None	9.0 ppm
	1 Hour	35 ppm	None	20 ppm
Lead	30 Day Average	None	None	1.5 µg/m <sup>3</sup>
	Calendar Quarter	1.5 µg/m <sup>3</sup>	1.5 µg/m <sup>3</sup>	None
	Rolling 3-Month Average	0.15 µg/m <sup>3</sup>	0.15 µg/m <sup>3</sup>	None
Nitrogen dioxide	Annual Arithmetic Mean	0.053 ppm	0.053 ppm	0.030 ppm
	1 Hour	0.100 ppm	None	0.18 ppm
Particulate matter (PM10)	24 Hour	150 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>
	Annual Arithmetic Mean	None	None	20 µg/m <sup>3</sup>
Fine particulate matter (PM2.5)	24 Hour	35 µg/m <sup>3</sup>	35 µg/m <sup>3</sup>	None
	Annual Arithmetic Mean	12.0 µg/m <sup>3</sup>	15 µg/m <sup>3</sup>	12 µg/m <sup>3</sup>
Ozone	1 Hour	None	None	0.09 ppm
	8 Hour	0.070 ppm	0.070 ppm	0.070 ppm
Sulfur dioxide	Annual Arithmetic Mean	0.030 ppm	None	None
	24 Hour	0.014 ppm	None	0.04 ppm
	3 Hour	None	0.5 ppm	None
	1 Hour	0.075 ppm	None	0.25 ppm
Hydrogen sulfide	1 Hour	None	None	0.03 ppm
Sulfates	24 Hour	None	None	25 µg/m <sup>3</sup>
Vinyl chloride	24 Hour	None	None	0.01 ppm
Visibility-reducing particles <sup>b</sup>	8 Hour	None	None	0.23/km

Source: California Air Resources Board 2016a

Notes:

µg/m<sup>3</sup> = micrograms per cubic meter; CARB = California Air Resources Board, ppm=parts per million<sup>a</sup> National primary standards are levels of air quality necessary to protect public health. National secondary standards are levels of air quality necessary to protect public welfare.<sup>b</sup> In 1989, CARB converted the statewide 10-foot visibility standard to an instrumental equivalent of "extinction of 0.23 per kilometer."

**Table 3.4-2 Pollutant Concentrations Measured at the Woodland-Gibson Road Air Quality Monitoring Station (2013–2015)**

Pollutant	2015	2014	2013
<b>1-Hour Ozone</b>			
Number of days State standard exceeded <sup>a</sup>	0	0	0
Maximum 1-hour concentration (ppm)	0.086	0.082	0.08
State designation value (ppm)	0.09	0.09	0.09
1-hour expected peak-day concentration (ppm)	0.085	0.087	0.086
<b>8-Hour Ozone</b>			
Number of days national standard exceeded	0	0	0
Number of days State standard exceeded <sup>a</sup>	4	1	0
Highest national 8-hour average (ppm)	0.071	0.071	0.067
Highest state 8-hour average (ppm)	0.072	0.072	0.067
8-hour national designation value (ppm)	0.067	0.068	0.069
8-hour State designation value (ppm)	0.072	0.076	0.08
Expected peak daily concentration (ppm)	0.076	0.079	0.08
<b>PM2.5</b>			
Number of days national 24-hour average exceeded <sup>b</sup>	0	0	0
National annual average ( $\mu\text{g}/\text{m}^3$ )	7.5	5.9	7.4
State annual average ( $\mu\text{g}/\text{m}^3$ )	7.5	*	*
National annual standard designation value ( $\mu\text{g}/\text{m}^3$ )	7	6.6	*
National 24-hour maximum <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ )	29.4	14.6	22
State 24-hour maximum <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ )	29.4	14.6	22
State annual standard designation value ( $\mu\text{g}/\text{m}^3$ )	8	6	6
National 24-hour designation value ( $\mu\text{g}/\text{m}^3$ )	19	16	*
<b>PM10<sup>e</sup></b>			
Number of days national 24-hour standard exceeded	*	0	0
Number of days State 24-hour standard exceeded <sup>a</sup>	*	0	23.3
State annual average ( $\mu\text{g}/\text{m}^3$ )	*	17.4	22.9
Maximum national 24-hour average <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ )	70.8	45	60.3
Maximum state 24-hour average <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ )	69.4	47.5	61.5
24-hour expected peak duration ( $\mu\text{g}/\text{m}^3$ )	79.9	71.9	74.1

Source: California Air Resources Board 2016b

Notes: ppm=parts per million; PM=particulate matter;  $\mu\text{g}/\text{m}^3$  = micrograms per cubic meter. \* Insufficient or no data to determine value.<sup>a</sup> An exceedance is not necessarily a violation.<sup>b</sup> The estimated number of days in the year that the national 24-hour PM2.5 standard would have been exceeded had sampling occurred every day of the year. Sampling can occur every day, once every 3 days, once every 6 days, or any combination thereof.<sup>c</sup> National statistics are based on standard conditions data and on samplers using federal reference or equivalent methods.<sup>d</sup> State statistics are based on local conditions data. State statistics are based on State-approved samplers.<sup>e</sup> Usually measurements collected every six days.



### 3.4.1.2 Attainment Status

Local monitoring data (Table 3.4-3) are used to determine whether geographic areas achieve air quality standards. These areas are designated as nonattainment, maintenance, attainment, or unclassified for the NAAQS and CAAQS. The four designations are defined as:

1. Nonattainment: status assigned to areas where monitored pollutant concentrations violated national and/or State ambient air-quality standards within the last three years.
2. Maintenance: status assigned to areas where monitored pollutant concentrations exceeded an air quality standard in the past but which are no longer in violation of that standard.
3. Attainment: status assigned to areas where monitored pollutant concentrations did not violate national and/or State ambient air-quality standards in the last three years.
4. Unclassified: status assigned to areas where data are insufficient to determine whether pollutant concentrations violated national and/or State ambient air-quality standards.

Ambient air quality in the project area and vicinity is monitored and regulated by the Yolo-Solano Air Quality Management District (YSAQMD). Table 3.4-3 summarizes the attainment status of the YSAQMD. The area is designated as nonattainment for PM<sub>2.5</sub> (federal), PM<sub>10</sub> (State), and ozone (federal and State), and maintenance for carbon monoxide (federal). Ozone and particulate matter are respiratory irritants that can cause serious health problems. Reactive organic gases (ROGs) and nitrogen oxides (NO<sub>x</sub>) are ozone precursors. Vehicle emissions, such as from light and heavy-duty vehicles traveling on roads and agricultural vehicles and equipment, contribute to ozone precursors and particulate matter. Wind-blown dust from dirt roads and agricultural activities, as well as from open burning of burn piles, also contributes to particulate matter. Diesel particulate matter is a component of inadequately filtered diesel exhaust and is considered to be a toxic air contaminant.

### 3.4.1.3 Odors

Objectionable or offensive odors rarely cause physical harm; however, because they are unpleasant they may lead to distress among the public and can generate citizen complaints to local governments. Odor impacts vary in frequency and severity, depending on the nature of the source, the wind direction, and the location of sensitive receptors. Existing sources of odors within the project area include diesel exhaust from agricultural vehicles and equipment.

### 3.4.1.4 Sensitive Receptors

Sensitive receptors are areas where human populations (especially children, seniors, and sick persons) are located and where there is reasonable expectation of continuous human exposure to air pollutants of concern. Typical sensitive receptors are residential subdivisions, schools, or hospitals. There are no sensitive receptors within the project area. The nearest sensitive receptors are residences 1.15 miles west of Fremont Weir and 1.17 miles east of Agricultural Road Crossing 3.

## 3.4.2 Regulatory Setting

This section briefly summarizes federal, State, and local regulations related to air quality in the project area. Federal air quality is regulated by the EPA. CARB implements these federal regulations and sets additional air quality regulations. YSAQMD is the local entity responsible for implementing federal and State air quality regulations.

**Table 3.4-3 Federal and State Attainment Status of the Yolo-Solano Air Quality Management District**

Pollutant	National Attainment Status <sup>a</sup>	California Attainment Status <sup>b</sup>
Carbon monoxide	Maintenance (Moderate <sup>c</sup> )	Attainment
Lead	Attainment	Attainment
Nitrogen dioxide	Attainment	Attainment
Particulate matter (PM10) <sup>d</sup>	Unclassified	Nonattainment
Fine particulate matter (PM2.5)	Nonattainment	Unclassified
Ozone (8-hour average)	Nonattainment (Severe 15 <sup>e</sup> )	Nonattainment
Sulfur dioxide	Attainment	Attainment
Hydrogen sulfide	^	Unclassified
Sulfates	^	Attainment
Vinyl chloride	^	+
Visibility-reducing particles	^	Unclassified

**Notes:**<sup>a</sup> Source: United States Environmental Protection Agency 2016b.<sup>b</sup> Source: California Air Resources Board 2016b.<sup>c</sup> Redesignated from Nonattainment to Maintenance in 2010. Moderate classification means an area has a designation value from 9.1 to 16.4 parts per million (ppm).<sup>d</sup> National annual PM10 standard was revoked on December 17, 2006.<sup>e</sup> Area has a design value of 0.113 up to but not including 0.119 ppm.

^ No national standard.

+ No data.

**3.4.2.1 Federal*****Clean Air Act***

The Clean Air Act (CAA) was created in 1970 and has been amended numerous times, with the last amendment occurring in 1990. The CAA regulates air emissions from mobile and stationary sources to protect public health and welfare. The law authorizes the EPA to establish the NAAQS to regulate emissions of hazardous air pollutants and sets dates for achieving compliance with the standards. The EPA has established NAAQS for six air pollutants, known as “criteria” pollutants: carbon monoxide, lead, nitrogen dioxide, particulate matter (PM10 and PM2.5), ozone, and sulfur dioxide. Pursuant to the CAA, states are required to prepare state implementation plans to achieve these standards.

***General Conformity Rule***

Established under the Clean Air Act (section 176(c)(4)), the General Conformity rule plays an important role in helping states and tribes improve air quality in those areas that do not meet the National Ambient Air Quality Standards (NAAQS). Under the General Conformity rule, federal agencies must work with state, tribal, and local governments in a nonattainment or maintenance area to ensure that federal actions conform to the air quality plans established in the applicable state or tribal implementation plan. Before any approval is given for an action to go forward, an agency must apply the applicability requirements to

a proposed federal action to determine if a conformity determination is required. Federal actions that exceed *de minimis* emission levels included in the rule are subject to a general conformity determination.

### 3.4.2.2 State

#### *California Clean Air Act*

CARB is responsible for protecting public health, welfare, and ecological resources by reducing air pollutants. CARB's regulations are contained in the California Code of Regulations Title 13, Division 3, and Title 17, Division 3. CARB is responsible for establishing ambient air-quality standards and determining if an area is in attainment, nonattainment, or unclassified for each standard.

#### *2016 State Strategy for the State Implementation Plan*

The 2016 State Strategy for the State Implementation Plan (State SIP Strategy) describes CARB staff's proposed strategy to attain health-based federal air-quality standards over the next 15 years as part of the SIPs due in 2016 (California Air Resources Board 2016c). The 2016 SIPs consist of a combination of State and local air-quality planning documents that must show how California will meet federal air quality standards for both ozone and fine particulate matter (PM<sub>2.5</sub>). CARB has the responsibility to develop SIP strategies for cars, trucks, and other mobile sources, as well as consumer products; local air districts are primarily responsible for controlling stationary sources. Recently, air quality standards have been lowered to more health-protective levels. These lower standards will require substantial reductions from both mobile and stationary sources to reach attainment. This will require comprehensive actions to transform technologies and fuels, community design, and transportation of people and freight.

Measures contained in the SIP include, but are not limited to, deploying cleaner technologies, lowering NO<sub>x</sub> engine standards, incentive funding to achieve further emissions reductions from on-road heavy-duty vehicles, and low-emission diesel requirements for off-road equipment. The CARB is committed to identifying funding needs to enhance the scale of cleaner technology, continuing partnerships with other agencies and the private sector to pursue research and pilot projects to advance zero emission technologies, identify schedules for incorporating improvements in system efficiencies and transportation systems, provide status updates and briefings to CARB, and provide reports to the EPA.

### 3.4.2.3 Local

#### *Yolo-Solano Air Quality Management District Attainment Plans*

At the local level the Yolo-Solano Air Quality Management District is required to meet air quality standards set by CARB. Local districts that do not meet the state standards are required to prepare an air quality attainment plan (AQAP) for meeting certain standards. Counties in the Sacramento Federal Nonattainment Area have adopted the *Northern Sacramento Valley Planning Area 2015 Triennial Air Quality Attainment Plan*, which outlines strategies for achieving the ozone and fine particulates standards (Sacramento Valley Air Quality Engineering and Enforcement Professionals 2015).

The YSAQMD 1992 AQAP for attaining and maintaining State ambient air-quality standards for ozone is also updated every three years. The 2015 Triennial Assessment and Plan Update (Triennial Plan Update) discusses the progress the YSAQMD has made towards improving the air quality in its jurisdiction since its last Triennial Plan Update, and includes proposed commitments for the 2015–2017 period (Yolo-Solano Air Quality Management District 2016). The YSAQMD is not required to prepare an attainment plan for particulate matter (PM<sub>10</sub> or PM<sub>2.5</sub>). Nonetheless, the YSAQMD continues to work to reduce

particulate emissions through rules affecting stationary sources, the construction industry, and YSAQMD's agricultural burning program. YSAQMD also works with CARB to identify measures that can, where possible, reduce ozone and particulate emissions. The YSAQMD has been proactive in its attempt to implement the most readily available, feasible, and cost-effective measures that can be employed to reduce emissions of particulate matter.

The AQAP also forecasts trends in emissions. This requires YSAQMD and CARB to develop an emission inventory, which is divided into five major categories: stationary, area-wide, on-road mobile, other mobile, and natural source groupings. Stationary sources include facilities at a fixed location, such as a production plant or landfill. Area sources are composed of smaller individual sources that, when aggregated, have significant emissions, such as architectural coatings and consumer products. On-road mobile sources include light and heavy-duty vehicles that travel streets and highways. Other mobile sources include agricultural and construction equipment, trains, plants, and recreational vehicles. Natural sources include such biological and geological sources as wildfires, windblown dust, and biogenic emissions from plants and trees. The proposed project would not result in a new stationary source or affect natural sources. Emissions that would be generated by the proposed project would be categorized as on-road mobile, other mobile, and area-wide sources; only these emission categories are discussed below. The emission inventory represents estimates of actual emissions calculated using reported or estimated process rates and emission factors. Developing future-year emission inventories, a current base-year inventory is projected forward in time. This projection is based on expected population, travel, employment, industrial and commercial activity, and energy-use growth rates. Emission reductions from control measures are also included in future-year inventories.

Mobile sources are responsible for the majority of ozone precursors emitted in the YSAQMD. Mobile source emissions are directly related to the overall population and the amount of vehicle miles traveled. Both population and vehicle miles traveled are expected to increase in the YSAQMD through 2025. Despite the increasing population and vehicle miles traveled, emissions are expected to decrease for mobile sources as a result of currently adopted control measures.

YSAQMD does not have direct regulatory authority over the mobile source portion of its emission inventory. But there are financial incentives that encourage the introduction of lower emission mobile-source technologies. These incentive programs can help fund projects that reduce traditional vehicle trips and encourage alternative modes of transportation and replace old off-road equipment and on-road heavy-duty vehicles with newer vehicles and equipment.

YSAQMD has authority to adopt rules regulating stationary and area sources. Reducing ROG and NO<sub>x</sub> is important; historically, NO<sub>x</sub> has been the more important precursor in the plan area because a 1-ton reduction of NO<sub>x</sub> can lower ozone concentrations to a greater extent than 1 ton of ROG reductions. As of 2012, ROG and NO<sub>x</sub> emissions from area-wide and stationary sources have decreased only slightly.

Construction activities in Yolo County must comply with current YSAQMD rules. Rules that may apply to the proposed project include:

- **Rule 2.5 Nuisance.** This rule prevents dust emissions and odorous emissions from creating a nuisance to people and property.
- **Rule 2.11 Particulate Matter Concentration.** This rule limits emissions of particulate matter greater than 0.1 grain per cubic foot of gas at dry standard conditions.

- **Rule 2.32 Stationary Internal Combustion Engines.** This rule limits the emission of NO<sub>x</sub> and CO<sub>2</sub> from stationary internal-combustion engines and requires equipment greater than 50 horsepower, other than vehicles, to be registered with the CARB Equipment Registration Program or with YSAQMD.

### 3.4.3 Environmental Effects

#### Significance Criteria

According to the CEQA Guidelines, the significance criteria established by the applicable air quality management district or air pollution control district may be relied on to make significance determinations for potential impacts on environmental resources. For the proposed project, significance criteria are established by YSAQMD. Analysis requirements and suggested thresholds of significance for construction- and operation-related pollutant emissions for proposed projects are described in YSAQMD's *Handbook for Assessing and Mitigating Air Quality Impacts* (Yolo-Solano Air Quality Management District 2007). The YSAQMD thresholds of significance in Table 3.4-4 represent the maximum emissions a project may generate before violating an air quality standard or contributing to a cumulative impact on regional air quality. For general conformity determinations, significance criteria are established for pollutants that have a non-attainment or maintenance status. The general conformity significance criteria in Table 3.4-4 represent *de minimis* thresholds.

Analysis of potential health effects from project-related emissions focuses on pollutants with the greatest potential to result in a significant impact on human health. In addition to the pollutants in Table 3.4-4, there are two criteria used for carbon monoxide impact screening. If either of the following is true of any intersection affected by construction-related traffic, then the proposed project can be said to have the potential to violate the carbon monoxide standard.

- The proposed project would reduce the peak-hour level of service (LOS) on one or more streets or intersections to unacceptable (typically level E or F).
- The proposed project would substantially worsen an already existing peak-hour LOS F on one or more streets or intersections in the project vicinity.

**Table 3.4-4 Yolo-Solano Air Quality Management District and Federal General Conformity Project-Level Thresholds of Significance for Pollutants**

Pollutant	Yolo-Solano Air Quality Management District Thresholds of Significance	Thresholds for Federal Conformity Determinations
Reactive organic gases (ROGs)	10 tons/year	25 tons/year
Nitrogen oxides (NOx)	10 tons/year	25 tons/year
Particulate matter (PM10)	80 pounds/day	100 tons/year
Fine particulate matter (PM2.5)	No established threshold	100 tons/year
Sulfur dioxide (SO2)	No established threshold	100 tons/year
Carbon monoxide (CO)	Violation of a State ambient air quality standard for CO	100 tons/year <sup>a</sup>
Toxic air contaminants from stationary sources	The probability of contracting cancer for the Maximally Exposed Individual (MEI) equals 10 in 1 million or more.  OR  Ground-level concentrations of non-carcinogenic toxic air contaminants would result in a Hazard Index equal to 1 for the MEI or greater.	No established threshold
Offensive odors	Odorous emissions in such quantities as to cause detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which may endanger the comfort, repose, health, or safety of any such person or the public, or which may cause, or have a natural tendency to cause, injury or damage to business or property.	No established threshold

Source: Yolo-Solano Air Quality Management District 2007; United States Environmental Protection Agency 2016c

Note:

<sup>a</sup> Only the urban centers in Yolo County are designated maintenance for CO; Fremont Weir is not located within the maintenance area. Only emissions within the maintenance area. Only emissions within the maintenance area are subject to this threshold, such as emissions generated by truck or worker trips traveling from Davis or West Sacramento.

## Methodology

The California Emission Estimates Model version 2013.2.2 (CalEEMod) was used to calculate potential emissions associated with construction, operation, and maintenance of the proposed project (ENVIRON International Corporation and the California Air Districts 2013). Estimates of equipment and usage input for the air quality analysis were also used for the greenhouse gas emissions analysis (refer to section 3.8, “Greenhouse Gas Emissions”). The assumptions, methodology, and results of the CalEEMod analysis are presented in Appendix D.

### 3.4.3.1 No-Action Alternative

Under the No-Action Alternative, construction activities associated with modification of the existing Fremont Weir fish ladder and associated channels, as well as of the three downstream agricultural road crossings, would not occur within the project area. Emissions would remain consistent with current agricultural practices within the project area and would not result in an increase of criteria pollutants that would adversely affect sensitive receptors or air quality.



### 3.4.3.2 Proposed Project Alternative

#### *a) Conflict with or obstruct implementation of the applicable air quality plan?*

**Less than Significant.** A project is deemed inconsistent with air quality plans if it would result in population, travel, employment, industrial and commercial activity, and energy-use growth that exceeds growth estimates included in the air quality plan. The proposed project would not permanently change the existing or planned transportation network or traffic patterns in the area. The project would not add any additional capacity to roadways or contribute to regional population or employment growth. The project would not result in stationary or mobile sources that would continue to use old technology or impede deploying cleaner technologies, as described in the State SIP Strategy.

The proposed project would generate construction-related mobile emissions and dust (discussed under *b* and *c* immediately below), but these emissions would not impede attainment of the NAAQS or CAAQS. Proposed operation and maintenance activities would be similar to existing conditions and would not impede attainment of the NAAQS or CAAQS. Accordingly, the proposed project would not conflict with the measures and commitments included in the YSAQMD AQAP or State SIP Strategy, and thus would result in a less-than-significant impact.

#### *b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation? — and —*

#### *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)?*

**Less than Significant with Mitigation Incorporated.** Proposed project construction is expected to occur from May through October, within a single calendar year. Equipment and materials for the proposed project would be transported to the project area by using haul trucks and heavy-duty construction equipment. Construction equipment anticipated for use would include excavators, cranes, graders, rollers, front-end loaders, dozers, backhoes, compressors, generators, and a water truck. Smaller vehicles would also be used to transport construction workers to the project area. Proposed project construction activities have the potential to affect ambient air quality by generating criteria pollutant emissions during operation of these vehicles and equipment. Potential project-related criteria pollutant emissions include carbon monoxide, sulfur dioxide, PM<sub>10</sub>, and PM<sub>2.5</sub>. Proposed project construction activities also have the potential to generate ROG and NO<sub>x</sub>, which are ozone precursors (refer to section 3.8, “Greenhouse Gas Emissions”).

The potential maximum daily and annual ROG, NO<sub>x</sub>, and criteria pollutant emissions calculated for proposed project construction activities are summarized in Table 3.4-5.

Potential emissions were calculated with the assumption that best management practices (BMPs) and minimization measures for exhaust emissions and dust would be implemented. The BMPs for minimization of exhaust emissions are included in DWR’s Greenhouse Gas Emissions Reduction Plan (GGERP) (refer to section 3.8, “Greenhouse Gas Emissions,” herein). YSAQMDs feasible mitigation measures for controlling dust are described below in Mitigation Measure AIR-1. Following implementation of these BMPs and mitigation measures, construction activities would not generate criteria pollutant emissions in excess of the YSAQMD thresholds of significance and thus would have a less-than-significant impact on air quality.

**Table 3.4-5 Calculated Maximum Daily (Pounds) and Annual (Tons) ROG, NOx, and Criteria Pollutant Emissions from Proposed Project Construction**

Period	ROGs	NOx	CO	PM10	PM2.5
Maximum Daily (pounds)	8.1786	77.7724	67.2416	37.7872	6.8054
Annual (tons) <sup>a</sup>	0.2672	2.4529	2.2567	0.8884	0.2195
YSAQMD Threshold <sup>b</sup>	10 tons/year	10 tons/year	Violation of a State ambient air quality standard for CO	80 pounds/day	No threshold established

## Notes:

CO = carbon monoxide, NOx = nitrogen oxides, PM2.5 = particulate matter less than 2.5 microns in diameter, PM10 = particulate matter less than 10 microns in diameter, ROGs = reactive organic gases, YSAQMD = Yolo-Solano Air Quality Management District

<sup>a</sup> All emissions would occur in 2017.

<sup>b</sup> YSAQMD has adopted annual (tons/year) thresholds for ROG and NOx and a daily (pounds/day) threshold for PM10.

See Appendix D of this document for the complete modeling results, which this table summarizes.

Operation of the gates at the fish passage structure would occur at a similar frequency and require use of vehicles and equipment similar to existing conditions. Maintenance of this facility, as well as the channels within the project area, would also be similar to maintenance activities under existing conditions.

Operation and maintenance activities would generate 0.000403 tons/year of reactive organic gases, 0.0452 tons/year of nitrogen oxides, 0.0319 tons/year of carbon monoxide, 1.4528 lb/day of PM10, and 1.2253 lb/day of PM2.5 (Appendix D). All of these values are well below the regional thresholds of significance. Therefore, proposed project operations and maintenance would result in a less-than-significant impact on air quality.

The project area is located within an air basin that is classified as nonattainment for PM10, PM2.5, and ozone. Project-related exhaust emissions from vehicles and equipment would contribute to increases of each of these criteria pollutants. Fugitive dust emissions from soil-disturbing activities and driving on unpaved roads would also contribute to increases of PM10. But project-related increases of these criteria pollutants would be temporary, would not exceed the *de minimis* thresholds established for federal general conformity, and would not exceed the YSAQMD thresholds of significance following implementation of DWR's GGERP BMPs and Mitigation Measure AIR-1. The proposed project would not contribute substantially to an existing air-quality violation or result in a cumulatively considerable impact on air quality. Project-related contributions of criteria pollutant emissions for which the region is in nonattainment would be less than significant.

#### **Mitigation Measure AIR-1: Implement YSAQMD Feasible Mitigation Measures for Fugitive Dust Prevention and Control**

The construction contractor shall implement YSAQMD's recommended construction BMPs for fugitive dust prevention and control. BMPs include the following:

- Water all active construction sites at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure.
- Haul trucks shall maintain at least 2 feet of freeboard.
- Cover all trucks hauling dirt, sand, or loose materials.

- Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed area.
- Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).
- Plant tree windbreaks on the windward perimeter of construction projects if adjacent to open land.
- Plant vegetative ground cover in disturbed areas as soon as possible.
- Cover inactive storage piles.
- Sweep streets if visible soil material is carried out from the construction site.
- Treat accesses to a distance of 100 feet from the paved road with a 6- to 12-inch layer of wood chips, gravel, or mulch.

*d) Expose sensitive receptors to substantial pollutant concentrations? — and —*

*e) Create objectionable odors affecting a substantial number of people?*

**Less than Significant.** A potential project-related source of pollutants and odors would be exhaust from construction vehicles and equipment. Exhaust from diesel-powered vehicles and equipment would also be a source of toxic air contaminants. That said, these potential construction-related pollutants and odors would be localized, would be temporary, and would not affect a substantial number of people owing to the distance of the nearest sensitive receptor to the project area. These pollutants would be further reduced with the implementation of the BMPs for minimization of exhaust emissions included in DWR's GGERP (refer to section 3.8, "Greenhouse Gas Emissions"). Construction-related pollutants and odors would not be likely to violate YSAQMD nuisance standards and would be less than significant.

As discussed above, project operation and maintenance activities would be similar to operation and maintenance activities under existing conditions. Because of the periodic and short-term nature of these activities, as well as the distance of the nearest sensitive receptor to the project area, ongoing operation and maintenance of the proposed project would not result in the exposure of sensitive receptors to substantial pollutant or odor emissions. The impact would be less than significant.

## 3.5 Biological Resources

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>IV. Biological Resources.</b>				
Would the project:				
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, the U.S. Fish and Wildlife Service, or the National Marine Fisheries Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

### 3.5.1 Affected Environment

#### 3.5.1.1 Terrestrial Biological Resources

##### *Vegetation Communities and Associated Wildlife*

Vegetation communities were derived from the geographic information system (GIS) information contained in the Fine-Scale Riparian Vegetation Mapping of the Central Valley Flood Protection Plan Area Final Report (California Department of Fish and Wildlife 2013). This report and the discussion below follow the National Vegetation Classification Standard (NVCS). Most areas were mapped to the NVCS Alliance level, with some areas mapped to a finer scale. Vegetation community descriptions below were derived from Vegetation Alliances and Associations of the Great Valley Ecoregion, California (Buck-Diaz et al. 2012). Lists of commonly associated wildlife species were based on California Wildlife Habitat Relationships descriptions (Mayer and Laudenslayer 1988) and field observations. A map of the vegetation communities within the study area is presented in Figure 3.5-1.

##### **Annual and Perennial Grassland**

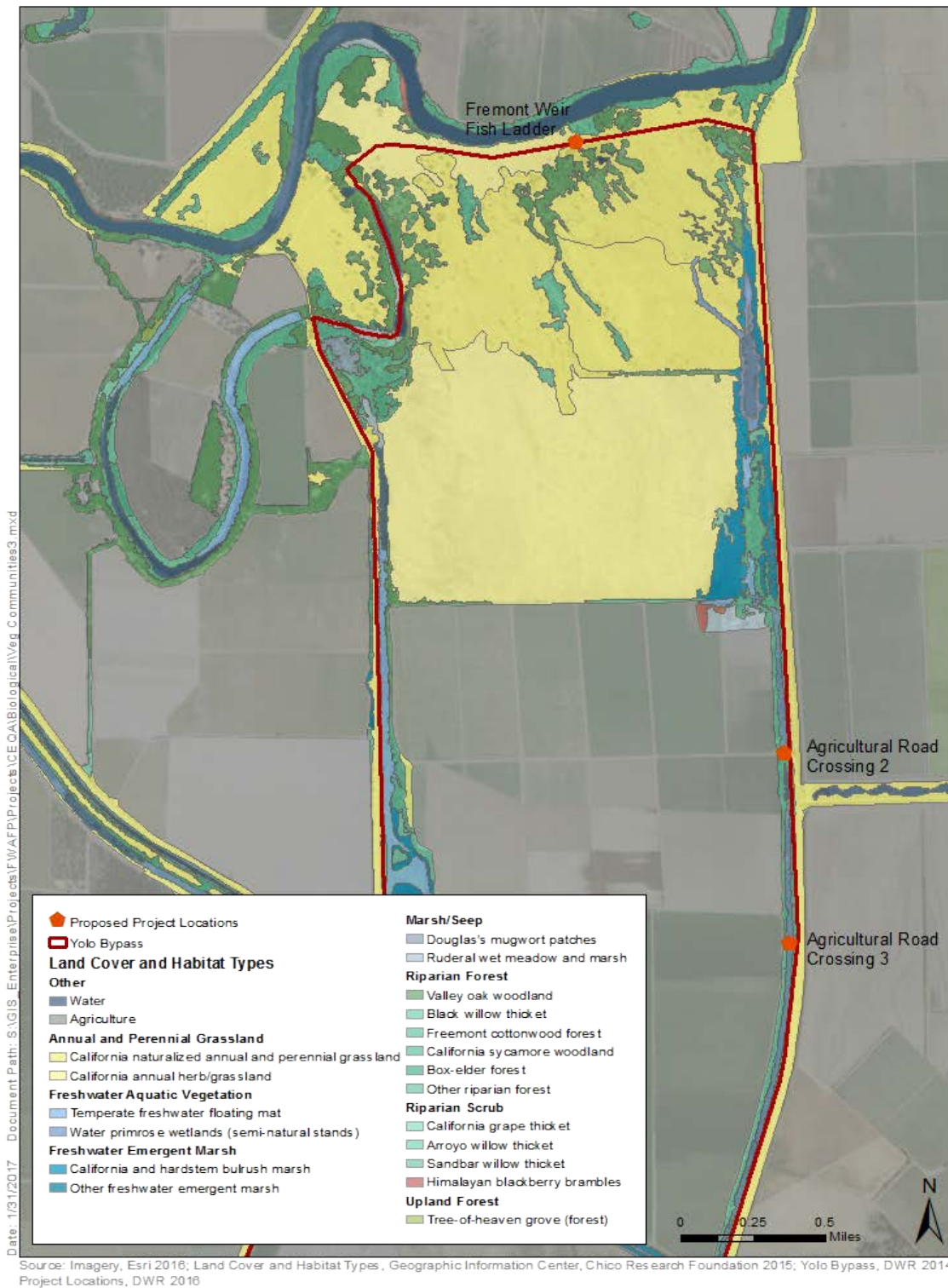
Annual and perennial grassland is found in the northern portion of the project area. Grasslands in the project area consist of native and non-native annual and perennial vegetation. Non-native annual species are characteristic of grasslands in the northern portion of the project area, including wild oats (*Avena barbata*), bindweed (*Convolvulus arvensis*), spiny sowthistle (*Sonchus asper*), and multiple *Bromus* species. Various non-native invasive plants are also common, including yellow star thistle (*Centaurea solstitialis*), milk thistle (*Silybum marianum*), and perennial pepperweed (*Lepidium latifolium*). Native species in the grassland include creeping wild rye (*Leymus triticoides*), Santa Barbara sedge (*Carex barbarae*), and Menzies' fiddleneck (*Amsinckia menziesii*).

Common wildlife species associated with annual and perennial grassland habitat include the following: black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Spermophilus beecheyi*), gopher snake (*Pituophis catenifer*), western fence lizard (*Sceloporus occidentalis*), California vole (*Microtus californicus*), American badger (*Taxidea taxus*), western kingbird (*Tyrannus verticalis*), western meadowlark (*Sturnella neglecta*), Brewer's blackbird (*Euphagus cyanocephalus*), American kestrel (*Falco sparverius*), turkey vulture (*Cathartes aura*), grasshopper sparrow (*Ammodramus savannarum*) and northern harrier (*Circus cyaneus*).

##### **Upland Forest**

Upland forest is not found in the project area but is found adjacent to the project area. Upland forest consists of stands of non-native tree-of-heaven (*Ailanthus altissima*) located outside the Yolo Bypass to the northwest of the project area, and stands of non-native ornamental trees south of Agricultural Road Crossing 3.

**Figure 3.5-1 Vegetation Communities in the Project Area**





### **Riparian Forest**

Riparian forest is found in and adjacent to the project area. Riparian forest consists of mainly native trees, including Fremont cottonwood (*Populus fremontii*), valley oak (*Quercus lobata*), California sycamore (*Platanus racemosa*), willow (*Salix* spp.), and box elder (*Acer negundo*). Riparian forest within the project area is predominantly Fremont cottonwood forest, valley oak woodland, and black willow thickets, which are found in and near the northern portion of the project area and along the Tule Canal.

Wildlife species commonly associated with riparian forest habitat include the following: red-shouldered hawk (*Buteo lineatus*), Swainson's hawk (*Buteo swainsonii*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), yellow-breasted chat (*Icteria virens*), acorn woodpecker (*Melanerpes formicivorus*), western gray squirrel (*Sciurus griseus*), western red bat (*Lasiurus blossevillii*), hoary bat (*Lasiurus cinereus*), and silver-haired bat (*Lasionycteris noctivagans*).

### **Riparian Scrub**

The riparian scrub habitat within and adjacent to the project area includes arroyo and narrow-leaf willow (*Salix lasiolepis* and *Salix exigua*) thickets, California grape (*Vitis californica*) thickets, and non-native Himalayan blackberry (*Rubus armeniacus*) brambles. Areas of riparian scrub are present within the project area near the old oxbow. The riparian forest present along the Tule Canal also contains elements of riparian scrub habitat. Areas of riparian scrub occur adjacent to the project area along the north side of the Sacramento River.

Wildlife species commonly associated with riparian scrub habitat include many of the same species associated with riparian forest habitat. Black-crowned night heron (*Nycticorax nycticorax*) and yellow-breasted chat are often closely associated with riparian scrub habitat.

### **Open Water and Fresh Water Aquatic Vegetation**

Aquatic habitats in and near the project area consist of open water and areas of freshwater aquatic vegetation. Open water includes the adjacent Sacramento River, the deep pond south of the existing fish ladder, the Tule Canal between Agricultural Road Crossings 2 and 3, and an area of the Tule Canal approximately 10.3 miles south of Agricultural Road Crossing 3. Open water also occurs in portions of the old oxbow to the west of the project area (Figure 3.5-1). Portions of the aquatic habitat found in the project area and the vicinity are covered by floating mat vegetation, dominated by Azolla, and water primrose (*Ludwigia* sp.) wetlands. These habitat types are found along the Tule Canal at Agricultural Road Crossings 2 and 3 and in other wet areas upstream of Agricultural Road Crossing 2. This habitat type is also found along the oxbow to the west of the project area.

Aquatic areas, both open water and vegetated, provide foraging habitat for a variety of wildlife species, including osprey (*Pandion haliaetus*), double-crested cormorant (*Phalacrocorax auritus*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), bank swallow (*Riparia riparia*), river otter (*Lutra canadensis*), western pond turtle (*Emys marmorata*), giant garter snake (*Thamnophis gigas*), western red bat, and silver-haired bat.

### **Freshwater Emergent Marsh and Other Wetland Vegetation**

Freshwater emergent wetland vegetation is primarily composed of California and hardstem bulrushes (*Schoenoplectus californicus* and *S. acutus*). These species often occur with water primrose and cattail (*Typha* sp.). Soils are organic and poorly aerated. This habitat type occurs outside the project area along

the northern portion of the Tule Canal. Freshwater emergent marsh is also found on the west side of the Yolo Bypass.

Freshwater emergent marsh and other wetland habitats provide habitat for a variety of wildlife species, including the red-winged blackbird (*Agelaius phoeniceus*), redhead (*Aythya americana*), least bittern (*Ixobrychus exilis*), American bittern (*Botaurus lentiginosus*), Modesto song sparrow (*Melospiza melodia mailliardi*), mallard (*Anas platyrhynchos*), giant garter snake, valley garter snake (*Thamnophis sirtalis*), common muskrat (*Ondatra zibethicus*), American bullfrog (*Rana catesbeiana*), and western pond turtle.

#### **Cultivated Land**

Cultivated land is found adjacent to the project area. A variety of crops, including rice and milo, are grown adjacent to the Tule Canal near all agricultural road crossings. Crops to the northeast of the Yolo Bypass in the Elkhorn Area (an area within the northern Elkhorn Basin) include walnuts and tomatoes.

Cultivated land can provide habitat for a variety of wildlife species. Flooded rice fields are known to provide habitat for valley garter snake and giant garter snake. Swainson's hawks forage over fields during harvest and cultivation.

#### **Urban**

Urban land is found approximately 10 miles southeast of Agricultural Road Crossing 3, outside the Yolo Bypass. There is no land classified as urban in the project area. Urban land outside the project area may provide habitat for such wildlife species as the Brazilian free-tailed bat (*Tadarida brasiliensis*), California ground squirrel, Botta's pocket gopher (*Thomomys bottae*), western fence lizard (*Sceloporus occidentalis*), and northern mockingbird (*Mimus polyglottos*).

#### ***Special-Status Terrestrial Species***

The biological resources study area for the proposed project includes all proposed project facilities, spoil areas, access routes, and temporary staging and construction areas. The study area also includes buffer areas, based on taxonomic groups, beyond the proposed project area to assess effects on fish and wildlife species. The biological assessment included database reviews and field surveys.

A list of special-status species potentially present within the study area was generated by searching the California Native Plant Society's (CNPS's) Inventory of Rare, Threatened, and Endangered Plants of California (California Native Plant Society 2016) and conducting a RareFind 5 query of the California Natural Diversity Database (CNDDB) (California Department of Fish and Wildlife 2016a). The search area was centered on the Knights Landing, Grays Bend, and Sacramento West United States Geological Survey 7.5-minute quadrangles (quads), and included the following surrounding quads: Clarksburg, Davis, Eldorado Bend, Florin, Grays Bend, Kirkville, Knights Landing, Merritt, Nicolaus, Rio Linda, Sacramento East, Sacramento West, Saxon, Sutter Causeway, Taylor Monument, Verona, and Woodland. The United States Fish and Wildlife Service's (USFWS's) Information, Planning, and Conservation System (IPaC) was used to generate a list of federally protected species with the potential to occur in the study area (United States Fish and Wildlife Service 2016). The IPaC search area was drawn around the northern portion of the Yolo Bypass and included records from Yolo, Sutter, and Sacramento counties.

DWR conducted field reconnaissance surveys for rare plant occurrences, as well as habitat assessments for reptiles and mammals, in 2014 and 2015 (California Department of Water Resources 2014a, 2014b,

2014c, 2015a, 2015b, 2015c, 2015d; HDR 2014). Avian habitat assessments were also conducted in 2015. Vegetation classifications were field verified in 2014 by DWR and HDR. Surveys were focused on areas of potential ground disturbance, including along the Fremont Weir, Tule Canal, the deep pond, and the agricultural road crossings. Detailed information for each of these surveys, including specific survey areas, survey dates, and results, are discussed below.

For the purposes of this assessment, special-status species are defined as species federally listed or State-listed as endangered, threatened, or candidate; State-listed as fully protected or species of special concern; federally listed as a bird of conservation concern; or ranked as a rare plant by CNPS.

### **Botanical Resources**

Thirty plant species were identified during database queries (Table 3.5-1). Of the 30 species reviewed, 24 were determined to have low potential to occur within the study area because of a lack of appropriate habitat or soils, or because the study area is outside of the species' known ranges. The six special-status plant species determined to have moderate or high potential to occur within the study area, based on presence of suitable habitat or known occurrences, are bristly sedge (*Carex comosa*), Peruvian dodder (*Cuscuta obtusiflora* var. *glandulosa*), woolly rose-mallow (*Hibiscus lasiocarpus* var. *occidentalis*), woolly-headed lessingia (*Lessingia hololeuca*), baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*), and Sanford's arrowhead (*Sagittaria sanfordii*). These plant species do not have a federal or State listing status, but are ranked by CNPS as rare plants.

Field surveys for special-status plants with the potential to occur in the study area were conducted by DWR on August 27, 2014; between March 2 and March 26, 2015; and between July 8 and July 30, 2015 (California Department of Water Resources 2014a, 2015a). HDR also conducted vegetation assessment surveys on August 27, 2014, and October 10, 2014 (HDR 2014). Occurrence information for the six special-status plant species is provided below.

**Table 3.5-1 Special-Status Plant Species Reviewed and Analyzed for Potential to Occur in the Study Area**

Common and Scientific Name	Status <sup>a</sup> (Federal/State/ CNPS)	Habitat/Range/Life History <sup>b</sup>	Potential for Occurrence
Depauperate milk-vetch <i>Astragalus pauperculus</i>	-/-/4.3	Mesic and volcanic habitats in chaparral, cismontane woodland, and valley and foothill grassland between 200–4,000-ft elevation.	Low. Annual non-native grassland within the study area may provide habitat, but is likely outside the species' elevational range. This species is not expected to occur within the study area and was not observed during botanical surveys.
Ferris' milk-vetch <i>Astragalus tener</i> var. <i>ferrisiae</i>	-/-/1B.1	Seasonally wet meadows and seeps, subalkaline flats in valley grassland.	Low. Seasonally wet areas are present within the study area, but alkaline soils are not. This species is not expected to occur within the study area and was not observed during botanical surveys.
Alkali milk-vetch <i>Astragalus tener</i> var. <i>tener</i>	-/-/1B.2	Vernal pools on alkali soil, playas on adobe clay in valley, and foothill grasslands between 1–196-ft elevation.	Low. Habitat is present in non-native annual grassland, but adobe clay playas are not present. This species is not expected to occur within the study area and was not observed during botanical surveys.
Heartscale <i>Atriplex cordulata</i> var. <i>cordulata</i>	-/-/1.B2	Saline or alkaline soils in chenopod scrub, meadows and seeps, and valley grassland with sandy soil below 1,840-ft elevation.	Low. Seasonally wet areas are present in the study area, but sandy or alkaline soils are not. This species is not expected to occur within the study area and was not observed during botanical surveys.
Brittlescale <i>Atriplex depressa</i>	-/-/1B.2	Alkaline clay in chenopod scrub, meadows and seeps, playas, valley and foothill grassland, and vernal pools; below 1,050-ft elevation.	Low. Alkaline soils are not present within the study area. This species is not expected to occur within the study area and was not observed during botanical surveys.
San Joaquin spearscale <i>Atriplex joaquinana</i>	-/-/1B.2	Alkaline soils in chenopod scrub, meadows and seeps, playas, and valley and foothill grassland between 1–2,740-ft elevation.	Low. Alkaline soils are not present within the study area. This species is not expected to occur within the study area and was not observed during botanical surveys.
Bristly sedge <i>Carex comosa</i>	-/-/2B.1	Marshes and swamps or lake margins, valley and foothill grassland, and coastal prairie below 2,050 ft.	Moderate. Marshes, swamps and grasslands are present in the study area. This species has the potential to occur within the study area but was not observed during botanical surveys.

Common and Scientific Name	Status <sup>a</sup> (Federal/State/ CNPS)	Habitat/Range/Life History <sup>b</sup>	Potential for Occurrence
Pappose tarweed <i>Centromadia parryi</i> <i>ssp. rudis</i>	-/-/4.2	Alkaline soils in valley and foothill grassland, vernal pools, seeps, and sometimes roadsides below 1,500-ft elevation.	Low. Alkaline soils are not present within the study area. This species is not expected to occur within the study area and was not observed during botanical surveys.
Palmate-bracted bird's-beak <i>Chloropyron</i> <i>palmatum</i>	FE/SE/1B.1	Alkaline soils in chenopod scrub and valley and foothill grasslands between 16-508-ft elevation.	Low. Alkaline soils are not present within the study area. This species is not expected to occur within the study area and was not observed during botanical surveys.
Peruvian dodder <i>Cuscuta obtusiflora</i> <i>var. glandulosa</i>	-/-/2B.1	Freshwater marshes and swamps below 920 ft.	Moderate. Marshes and swamps are present in the study area. This species has the potential to occur within the study area but was not observed during botanical surveys.
Dwarf downingia <i>Downingia pusilla</i>	-/-/2B.2	Valley and foothill grasslands and vernal pools below 1,460 ft.	Low. Suitable habitat is lacking because of dominance of grasses and ruderal forbs and lack of a grazing regime. Tall vegetation easily competes successfully against this low-growing species. This species is not expected to occur within the study area and was not observed during botanical surveys.
Stinkbells <i>Fritillaria agrestis</i>	-/-/4.2	Clay, sometimes serpentine soils in chaparral, cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland below 5,100 ft.	Low. Clay and serpentine soils are not present in the study area. This species is not expected to occur within the study area and was not observed during botanical surveys.
Boggs Lake hedge-hyssop <i>Gratiola</i> <i>heterosepala</i>	-/SE/1B.2	Clay soils in lake margins or margins of marshes and swamps and vernal pools below 7,800 ft.	Low. Clay and serpentine soils are not present in the study area. This species is not expected to occur within the study area and was not observed during botanical surveys.
Hogwallow starfish <i>Hesperervax</i> <i>caulescens</i>	-/-/4.2	Mesic valley and foothill grassland, sometimes in clay soils and shallow vernal pools; can be found in alkaline soils below 1,660 ft.	Low. Alkaline soils and vernal pools are not present in the study area. This species is not expected to occur within the study area and was not observed during botanical surveys.
<b>Woolly rose-mallow</b> <b><i>Hibiscus</i></b> <b><i>lasiocarpus</i></b> <b><i>var. occidentalis</i></b>	-/-/1B.2	Margins of freshwater marshes, wet riverbanks, on riprap levees, and on low, peat islands below 400-ft elevation.	<b>High.</b> Wet or ponded areas within the study area provide habitat for this species. This species was observed during botanical surveys in the study area.

Common and Scientific Name	Status <sup>a</sup> (Federal/State/ CNPS)	Habitat/Range/Life History <sup>b</sup>	Potential for Occurrence
Northern California black walnut <i>Juglans californica</i> <i>var. hindsii</i>	-/-1B.1	Riparian forest and riparian woodland below 1,440 ft. Non-native black walnuts planted as crops hybridize with native black walnut.	Low. There is suitable habitat for this species in the study area. Black walnuts occur in the study area, but it is not known whether they are hybrids or natives. Yet, there is only one known occurrence of native black walnut in Northern California, and this species is presumed extirpated in Sacramento and Yolo counties. Consequently, this native species is not expected to occur within the study area.
Legenere <i>Legenere limosa</i>	-/-1B.1	Vernal pools up to 2,890-ft elevation.	Low. Vernal pools are not present in the study area. This species is not expected to occur within the study area and was not observed during botanical surveys.
Heckard's peppergrass <i>Lepidium latipes</i> <i>var. heckardii</i>	-/-1B.2	Alkaline soils of vernal pool margins, alkaline flats, salt marsh edges; below 100-ft elevation.	Low. Alkaline soils are not present within the study area. This species is not expected to occur within the study area and was not observed during botanical surveys.
Woolly-headed lessingia <i>Lessingia hololeuca</i>	-/-3	Sometimes restricted to clay or serpentine soils in broad-leafed upland forest, coastal scrub, lower montane coniferous forest or valley and foothill grassland (sometimes roadsides) between 30–1,800-ft elevation.	Moderate. Suitable valley grassland habitat is present in the study area. This species has the potential to occur within the study area, but was not observed during botanical surveys.
Mason's lilaeopsis <i>Lilaeopsis masonii</i>	-/-1B.1	Brackish or freshwater marshes and swamps and riparian scrub near sea level.	Low. This species is found near sea level in the intertidal zone. This species is not expected to occur within the study area and was not observed during botanical surveys.
Little mouseltail <i>Myosurus minimus</i>	-/-3.1	Valley and foothill grasslands, vernal pools below 2,100 ft.	Low. Suitable habitat is lacking because of dominance of grasses and ruderal forbs and lack of a grazing regime. Tall vegetation easily competes successfully against this low-growing species. This species is not expected to occur within the study area and was not observed during botanical surveys.



Common and Scientific Name	Status <sup>a</sup> (Federal/State/ CNPS)	Habitat/Range/Life History <sup>b</sup>	Potential for Occurrence
Baker's navarretia <i>Navarretia leucocephala</i> ssp. <i>Bakeri</i>	-/-1B.1	Mesic environments in valley and foothill grassland, vernal pools, meadows and seeps, lower-montane coniferous forest, and cismontane woodland below 5,700-ft elevation.	Moderate. Mesic valley grassland habitat is present in the study area. This species has the potential to occur within the study area, but was not observed during botanical surveys.
Colusa grass <i>Neostapfia colusana</i>	FT/SE/1B.1	Found in adobe or large vernal pools below 660-ft elevation.	Low. Alkaline soils are not present within the study area. This species is not expected to occur within the study area and was not observed during botanical surveys.
Bearded popcornflower <i>Plagiobothrys hystriculus</i>	-/-1B.1	Often found in vernal swales in mesic valley and foothill grasslands and in vernal pool margins below 900 ft.	Low. Suitable habitat is lacking because of dominance of grasses and ruderal forbs, and lack of a grazing regime. Tall vegetation easily competes successfully against this low-growing species. This species is not expected to occur within the study area and was not observed during botanical surveys.
California alkali grass <i>Puccinellia simplex</i>	-/-1B.2	Alkaline soils of vernal pools, sinks, flats, and lake margins of chenopod scrub, meadows, seeps, valley and foothill grassland; below 3,050-ft elevation.	Low. Alkaline soils are not present within the study area. This species is not expected to occur within the study area and was not observed during botanical surveys.
Sanford's arrowhead <i>Sagittaria sanfordii</i>	-/-1B.2	Found in shallow freshwater marshes and swamps between 16–2,130-ft elevation.	Moderate. Wet or ponded areas within the study area provide potential habitat for this species. This species has the potential to occur within the study area, but was not observed during botanical surveys.
Suisun Marsh aster <i>Symphyotrichum lentum</i>	-/-1B.2	Found in brackish and freshwater marshes and swamps at sea level.	Low. Freshwater marsh occurs in the study area. The nearest occurrence of Suisun Marsh aster is approximately 12 miles south of Agricultural Road Crossing 3. This occurrence is at the edge of the known species range; the study area is outside of the known range of the species. This species is not expected to occur within the study area and was not observed during botanical surveys.
Wright's trichocoronis <i>Trichocoronis wrightii</i> var. <i>wrightii</i>	-/-2.1	Alkaline soils in meadows and seeps, marshes and swamps, riparian forest and vernal pools between 30–1,380 ft.	Low. Alkaline soils are not present within the study area. This species is not expected to occur within the study area and was not observed during botanical surveys.

Common and Scientific Name	Status <sup>a</sup> (Federal/State/ CNPS)	Habitat/Range/Life History <sup>b</sup>	Potential for Occurrence
Saline clover <i>Trifolium hydrophilum</i>	-/-/1B.2	Salt marshes and in alkaline soils in moist valley and foothill grasslands and vernal pools; below 720-ft elevation.	Low. Alkaline soils are not present within the study area. This species is not expected to occur within the study area and was not observed during botanical surveys.
Crampton's tuctoria or Solano grass <i>Tuctoria mucronata</i>	FE/SE/1B.1	Found in valley and foothill mesic grasslands and vernal pools between below 30-ft elevation.	Low. Valley grassland is present within the study area, but alkaline soils and appropriate seasonal wetland conditions are not. This species is not expected to occur within the study area and was not observed during botanical surveys.

Sources: California Native Plant Society 2016; California Department of Fish and Wildlife 2016a; California Department of Fish and Wildlife 2016b; United States Fish and Wildlife Service 2016

Notes: CNPS = California Native Plant Society, ft = feet

Species names that appear in bold indicate species that were observed during survey.

<sup>a</sup> Status:

Federal: FE = listed as Endangered under the federal Endangered Species Act, FT = listed as Threatened under the federal Endangered Species Act:

State: SE = listed as Endangered under the California Endangered Species Act

California Rare Plant Rank:

1B.1 = ranked as Rare, Threatened, or Endangered in California and elsewhere (seriously threatened in California) by the CNPS

1B.2 = ranked as Rare, Threatened, or Endangered in California and elsewhere (fairly threatened in California) by the CNPS

2.1 = ranked as Rare, Threatened, or Endangered in California, but more common elsewhere (seriously threatened in California) by the CNPS

3 = ranked as plants requiring more information in California that are under review (seriously threatened in California) by the CNPS

4.2 = ranked as plants having a limited distribution within California that should be watched (fairly threatened in California) by the CNPS

<sup>b</sup> Life history information included when necessary to determine the potential for occurrence within the study area or to support the associated impact analysis.

### Bristly Sedge

Bristly sedge has a CNPS rare plant rank of 2 B.1. The nearest CNDDDB occurrence of bristly sedge is approximately 25 miles south of Agricultural Road Crossing 3; there are no CNDDDB occurrences of bristly sedge within Yolo County. This species has the potential to occur in wet or ponded areas along Tule Canal, as well as in grassland portions of the study area near the Upstream Channel and Reach 1. The bloom period for bristly sedge ranges from May through September. This species was not observed during surveys.

### Peruvian Dodder

Peruvian dodder has a CNPS rare plant rank of 2 B.1. The nearest CNDDDB occurrence of Peruvian dodder is approximately 24.8 miles southwest of Agricultural Road Crossing 3 outside the Yolo Bypass; there are no CNDDDB occurrences of Peruvian dodder within Yolo County. This species has the potential

to occur in wet or ponded areas along Tule Canal. The bloom period for Peruvian dodder ranges from July through October. This species was not observed during surveys.

#### Woolly Rose-Mallow

Woolly rose-mallow has a CNPS rare plant rank of 1B.2. This species has the potential to occur in wet or ponded areas along Tule Canal. The bloom period for this species ranges from June through September. Woolly rose-mallow was observed in the study area near the deep pond, upstream of Agricultural Road Crossing 2, and downstream of Agricultural Road Crossing 3 (Figure 3.5-2).

#### Woolly-Headed Lessingia

Woolly-headed lessingia has a CNPS rare plant rank of 3. There are no CNDDDB occurrences of woolly-headed lessingia within the record search area. This species has the potential to occur in grassland portions of the study area near the Upstream Channel and Reach 1. The bloom period for woolly-headed lessingia ranges from June through October. This species was not observed during surveys.

#### Baker's Navarretia

Baker's navarretia has a CNPS rare plant rank of 1B.1. The nearest CNDDDB occurrence of Baker's navarretia is within the Yolo Bypass, approximately 20 miles southwest of Agricultural Road Crossing 3. This species has the potential to occur in grassland portions of the study area near the Upstream Channel and Reach 1. The bloom period for this species ranges from April through July. This species was not observed during surveys.

#### Sanford's Arrowhead

Sanford's arrowhead has a CNPS rare plant rank of 1B.2. The nearest CNDDDB occurrence of Sanford's arrowhead is approximately 9 miles southeast of Agricultural Road Crossing 3; there are no CNDDDB occurrences of Sanford's arrowhead within Yolo County. This species has the potential to occur in wet or ponded areas along Tule Canal. The bloom period for Sanford's arrowhead ranges from May through October. This species was not observed during surveys.

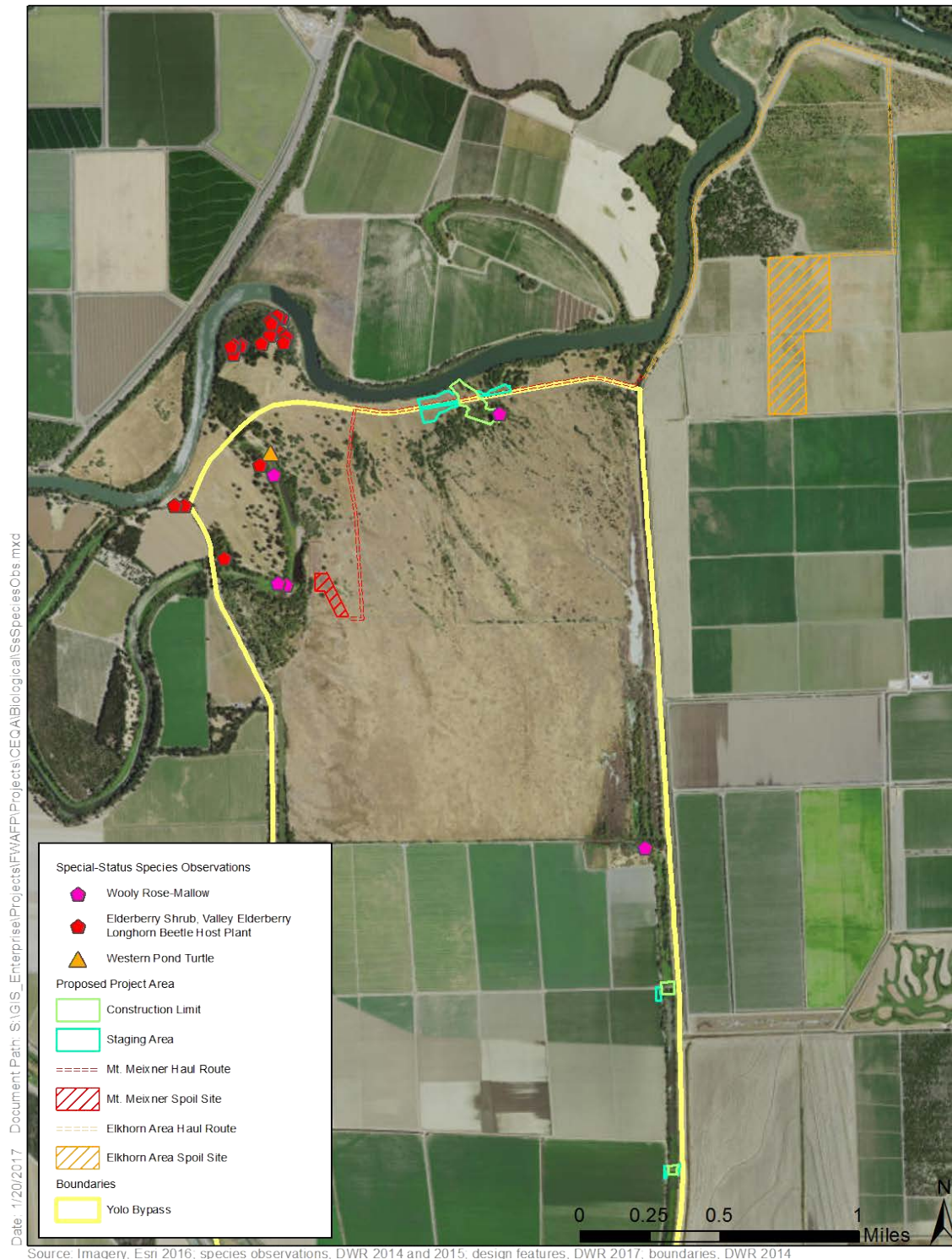
### **Wildlife Resources**

#### Invertebrates

Four special-status invertebrate species were identified during database queries (Table 3.5-2). Of these species, three were determined to have low potential to occur within the study area because of lack of suitable habitat. The only special-status invertebrate determined to have moderate potential to occur within the study area is the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*).

The valley elderberry longhorn beetle was listed as threatened under the federal Endangered Species Act (ESA) (Federal Register [FR], Vol. 45, page 52803 [45 FR 52803]) on August 8, 1980. On October 2, 2006, USFWS, in their 5-year review, recommended for this species to be removed from the endangered species list (United States Fish and Wildlife Service 2006). USFWS withdrew the proposed rule to remove this species from the endangered species list on September 17, 2014. Best available science indicated that threats to the species and its habitat have not been reduced to the point of delisting. *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* were established by the USFWS in 1999 (United States Fish and Wildlife Service 1999). The guidelines were designed mainly to mitigate development-related impacts on this species. The study area is not within designated critical habitat for the valley elderberry longhorn beetle.

**Figure 3.5-2 Special-Status Species Observed During 2014 and 2015 Field Surveys**



While valley elderberry longhorn beetle surveys have not been conducted, this species' host plant, the blue elderberry (*Sambucus nigra* ssp. *caerulea*), was observed during botanical field surveys near the Sacramento River and near the old oxbow (Figure 3.5-2) (California Department of Water Resources 2014a, 2015a; HDR 2014). There are also multiple CNDDDB records of this species near the study area, including an occurrence along the proposed access route on County Road 16, approximately 0.2 mile west of the County Road 117 junction.

#### Reptiles and Amphibians

Two special-status reptiles and two special-status amphibian species were identified during database queries (Table 3.5-2). Of these species, the two amphibians were determined to have low potential to occur within the study area because the study area is outside the species' ranges. The two special-status reptile species determined to have moderate or high potential to occur in the study area are the western pond turtle and giant garter snake.

Surveys were conducted by DWR on August 28, 2014, May 28, 2015, and June 3, 2015, to identify potential western pond turtle and giant garter snake habitat in the study area (California Department of Water Resources 2014b, 2015b). Occurrence information for these two special-status reptile species is provided below.

*Western Pond Turtle.* The western pond turtle is a California species of special concern and is currently under review for potential listing under the ESA. Suitable western pond turtle habitat is present in aquatic areas at the deep pond and in the Tule Canal at each agricultural road crossing. Areas adjacent to these aquatic habitats provide potential western pond turtle upland habitat for nesting and dispersal. Eggs are laid from March to August, depending on local conditions, often on such upland habitat as sandy banks or grassy open fields up to 0.33 mile (0.5 kilometer) from water. Western pond turtles were observed during habitat assessment surveys near the old oxbow on the west side of the Yolo Bypass (Figure 3.5-2).

*Giant Garter Snake.* The giant garter snake was listed as threatened under the ESA (58 FR 54053) on October 20, 1993, and was listed as a California threatened species on July 27, 1971. No critical habitat has been designated for this species. Giant garter snakes are typically active early spring through late fall in areas with adequate water to maintain dense populations of prey species and are inactive during winter months, when they occupy higher upland hibernacula. Mating occurs soon after spring emergence. Giant garter snakes give birth to live young between mid-July and early September. Suitable giant garter snake habitat is present in aquatic areas in the Tule Canal at each agricultural road crossing. Upland habitat adjacent to these aquatic habitats provides areas for giant garter snakes to bask, nest, and access refugia from floods. The nearest CNDDDB occurrence is approximately 2 miles east of Agricultural Road Crossing 3, outside the Yolo Bypass. The nearest CNDDDB occurrence within the Yolo Bypass is approximately 3.5 miles southwest of Agricultural Road Crossing 3. There is also a CNDDDB occurrence in the Tule Canal approximately 4.5 miles south of Agricultural Road Crossing 3. Giant garter snakes were not observed during surveys.

**Table 3.5-2 Special-Status Wildlife Species Reviewed and Analyzed for Potential to Occur in the Study Area**

Common and Scientific Name	Status <sup>a</sup> (Federal/State)	Habitat/Range/Life History <sup>b</sup>	Potential for Occurrence
<b>Invertebrates</b>			
Conservancy fairy shrimp <i>Branchinecta conservatio</i>	FE/-/-	Vernal pools and wetlands in the valley and foothill grasslands. Found in large, turbid pools formed by old braided alluvium. Endemic to the grasslands of the northern two-thirds of the Central Valley.	Low. Vernal pools are not present within the study area. This species is not expected to occur within the study area.
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT/-/-	Valley and foothill grassland vernal pools and wetlands. Found in small clear-water sandstone depressions, grass swales, earth slumps or basalt depression pools.	Low. Vernal pools are not present within the study area. Fish species present in wet or ponded areas in the study area would exclude this species. This species is not expected to occur within the study area.
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	FT/-/-	Occurs only in the Central Valley in close association with the blue elderberry ( <i>Sambucus nigra</i> ssp. <i>caerulea</i> ). Spends most of its life in the larval stage, where it lives within the stems of the elderberry plant. Adults emerge from the stems late March–June.	Moderate. Blue elderberry (the host plant of this species) was not observed within the project area, but was observed within in the larger study area during botanical surveys.
Vernal pool tadpole shrimp <i>Lepidurus packardii</i>	FE/-/-	Valley and foothill grasslands, vernal pools, and wetlands. Inhabits vernal pools and swales with clear to highly turbid water. Found in pools that are wet long enough to support fish species.	Low. Vernal pools are not present within the study area. Small seasonally wet or ponded areas likely do not persist long enough to support this species. This species is not expected to occur within the study area.

Common and Scientific Name	Status <sup>a</sup> (Federal/State)	Habitat/Range/Life History <sup>b</sup>	Potential for Occurrence
<b>Amphibians</b>			
California tiger salamander <i>Ambystoma californiense</i>	FT/ST, SSC/-	Found in a variety of habitats with seasonal aquatic habitat, including cismontane woodland, meadows and seeps, riparian woodland, valley and foothill grassland, and vernal pools. Requires underground refuges, and is especially dependent on ground squirrel burrows. Tiger salamanders breed and lay eggs primarily in vernal pools and other temporary rainwater ponds following relatively warm rains in November–February.	Low. Suitable aquatic habitat is not present within the study area, and the study area is on the edge or outside of the known species range. This species is not expected to occur within the study area.
California red-legged frog <i>Rana draytonii</i>	FT/-/-	Requires aquatic habitat, including pools, backwaters of streams, ponds, marshes, and springs, for breeding. Can also breed in stock ponds or other artificial water impoundments. Eggs are attached to emergent vegetation. Breeds March–July. Requires access to upland or riparian habitat for dispersal. Ranges from Riverside County to Mendocino County along the coast and in the Sierra Nevada range from Calaveras County to Butte County.	Low. The study area is outside the known species range. This species is not expected to occur within the study area.
<b>Reptiles</b>			
Western pond turtle <i>Emys marmorata</i>	-/SSC/-	Uses aquatic habitats and artificial flowing waterways in the Delta and surrounding waters. Found in ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Found below 6,000-ft elevation. Requires upland habitat for basking.	<b>High.</b> Agricultural ditches, wetlands, and open water within the study area provide aquatic habitat; adjacent uplands provide basking habitat. This species was observed during surveys.



Common and Scientific Name	Status <sup>a</sup> (Federal/State)	Habitat/Range/Life History <sup>b</sup>	Potential for Occurrence
<b>Reptiles</b>			
Giant garter snake <i>Thamnophis gigas</i>	FT/ST/-	Endemic to the marshes and swamps, riparian scrub, and wetland habitats of the Central Valley with emergent, herbaceous vegetation. Prefers freshwater marshes and low-gradient streams, but also uses drainage canals and irrigation ditches. Occupies upland habitat with grassy banks and openings in waterside vegetation for basking.	Moderate. Wetlands within the study area provide suitable aquatic habitat; adjacent uplands provide basking habitat. This species has the potential to occur within the study area, but was not observed during surveys.
<b>Mammals</b>			
Pallid bat <i>Antrozous pallidus</i>	-/SSC/-	Utilizes a wide variety of habitats throughout the state, including valley and foothill grasslands. Common in open, dry habitats with rocky areas for roosting, which must provide protection from hot temperatures. Generally roosts in caves or caverns or structures high above the ground where the entrance/exit is unobstructed.	Moderate. Open grassland, snags, and trees within the study area provide potential roosting and maternal colony habitat. This species has the potential to occur within the study area.
Western red bat <i>Lasiurus blossevillii</i>	-/SSC/	Riparian habitat with mature cottonwood and sycamore trees, cismontane woodland, or lower montane coniferous forest. Roosts in trees along habitat edges and varied habitat where trees are protected from above and open below for foraging.	Moderate. Riparian habitat with large, mature trees within the study area provides potential maternal roosting habitat. This species has the potential to occur within the study area.
American badger <i>Taxidea taxus</i>	-/SSC/-	Found in a broad range of habitats throughout the state. Abundant in dry, open shrub, forest, and herbaceous habitats with friable soils on uncultivated ground. Requires sufficient food; preys on burrowing rodents. Digs burrows.	Moderate. Open, uncultivated areas within the study area provide potential habitat. This species has the potential to occur within the study area, but was not observed during surveys.

Common and Scientific Name	Status <sup>a</sup> (Federal/State)	Habitat/Range/Life History <sup>b</sup>	Potential for Occurrence
<b>Birds</b>			
<b>Tricolored blackbird</b> <i>Agelaius tricolor</i>	-/ST (emergency protections), SSC/ BCC	Nests in freshwater marshes with tall emergent vegetation, in upland habitats, and in silage fields. Forages in agricultural areas, particularly where livestock is present.	<b>High.</b> Agricultural ditches and slow-moving watercourses within the study area provide potential nesting habitat. This species was observed during surveys.
Grasshopper sparrow <i>Ammodramus savannarum</i>	-/SSC/-	Nests in heavy vegetation and shrub habitats. Forages in open grasslands with bare ground.	Moderate. Scrub areas within the study area provide potential nesting habitat; grasslands provide potential foraging habitat. This species has the potential to occur within the study area, but was not observed during surveys.
Short-eared owl <i>Asio flammeus</i>	-/SSC/-	Found in emergent wetland and grassland habitats. Nests on the ground in prairies and agricultural areas. Preys on small mammals. Breeds throughout Northern California. Migratory or year-round resident in Northern and Central California.	Moderate. Wetlands and grasslands within the study area provide potential nesting habitat. This species has the potential to occur within the study area, but was not observed during surveys.
Burrowing owl <i>Athene cunicularia</i>	-/SSC/BCC	Prefers open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Suitable habitat is characterized by burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation for foraging. In agricultural environments, burrowing owls often nest along roadsides and water conveyance structures. Nests and roost burrows are commonly dug by ground squirrels.	Low. Lack of burrows, heavy vegetation, and regular bypass flooding are likely reducing the quality of nesting and foraging habitat within the study area. This species is not expected to occur and was not observed during surveys.
Redhead <i>Aythya americana</i>	-/SSC/-	Typically nests in freshwater emergent wetlands with areas of deep, open water and dense stands of cattails and tules (Shuford and Gardali 2008). Forages in wetlands and large, deep bodies of water.	Moderate. Wetlands within the study area provide potential nesting and foraging habitat. This species has the potential to occur within the study area, but was not observed during surveys.

Common and Scientific Name	Status <sup>a</sup> (Federal/State)	Habitat/Range/Life History <sup>b</sup>	Potential for Occurrence
<b>Birds</b>			
<b>Swainson's hawk</b> <i>Buteo swainsoni</i>	-/ST/BCC	Nests in riparian areas. Forages in grasslands with scattered trees, juniper sage flats, riparian areas, savannahs, and agricultural or ranch habitats.	<b>High.</b> Riparian areas within the study area provide nesting habitat; grasslands provide foraging habitat. This species was observed during surveys.
Western snowy plover <i>Charadrius alexandrinus nivosus</i>	FT/SSC/BCC	Sandy beaches, salt pond levees, and shores of large alkali lakes. Present at nesting sites April –August.	Low. Beaches, salt pond levees, and alkali lakes are not present within the study area. This species is not expected to occur within the study area and was not observed during surveys.
Mountain plover <i>Charadrius montanus</i>	-/SSC/BCC	Nests and forages in grasslands, plowed fields with short vegetation and bare ground. Prefers areas with burrowing rodents. The Central Valley is only within the winter range of this species and it is typically found September–mid-March with the highest abundance December–February (Shuford and Gardali 2008).	Moderate. Grasslands present within the study area provide potential wintering habitat. This species has the potential to occur within the study area, but was not observed during surveys.
<b>Northern harrier</b> <i>Circus cyaneus</i>	-/SSC/-	Nests on the ground in grasslands across North America. Forages in marshes and grassland.	<b>High.</b> Grasslands within the study area provide potential nesting habitat; wetland and grassland areas provide potential foraging habitat. This species was observed during surveys.
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	FT/SE/-	Breeding habitat primarily consists of large blocks or contiguous areas of riparian habitat, particularly cottonwood–willow riparian woodlands. Prefers dense riparian thickets with dense low-level foliage near slow-moving water sources.	Low. Riparian areas within the study area may provide marginal foraging and migratory habitat. This species has the potential to occur within the study area, but is not expected to breed within the study area. This species was not observed during surveys.
<b>White-tailed kite</b> <i>Elanus leucurus</i>	-/FP/-	Nests in riparian habitat, oak woodlands, and isolated trees. Forages in grasslands and agricultural fields.	<b>High.</b> Riparian areas and isolated trees within the study area provide potential nesting habitat; grasslands provide foraging habitat. This species was observed during surveys.

Common and Scientific Name	Status <sup>a</sup> (Federal/State)	Habitat/Range/Life History <sup>b</sup>	Potential for Occurrence
<b>Birds</b>			
Yellow-breasted chat <i>Icteria virens</i>	-/SSC/-	Nests in low, dense vegetation with open tree coverage. Found in riparian scrub habitat along streams, swamps, and ponded areas and along fencerows and uplands of abandoned agricultural land.	Moderate. Densely vegetated areas within the study area provide potential nesting and foraging habitat. This species has the potential to occur within the study area, but was not observed during surveys.
Least bittern <i>Ixobrychus exilis</i>	-/SSC/-	Nests on floating platforms in freshwater and brackish marshes with emergent vegetation. Forages in emergent vegetation often in areas with clumps of woody plants and deep water.	Moderate. Freshwater wetland areas within the study area provide potential nesting and foraging habitat. This species has the potential to occur within the study area, but was not observed during surveys.
<b>Loggerhead shrike</b> <i>Lanius ludovicianus</i>	-/SSC/-	Grasslands and other open habitat throughout North America. Northern and Central California provide year-round habitat.	<b>High.</b> Grasslands within the study area provide potential nesting and foraging habitat. This species was observed during surveys.
California black rail <i>Laterallus jamaicensis coturniculus</i>	-/ST, FP/-	Broad distribution in tidal and freshwater marshes with emergent vegetation and shallow water in North America. California populations are mostly resident.	Low. Freshwater wetland areas within the study area provide low quality nesting and foraging habitat. This species is not expected to occur within the study area.
<b>Modesto song sparrow</b> <i>Melospiza melodia mailliardi</i>	-/SSC/-	Nests and forages in emergent freshwater marshes dominated by tules ( <i>Scripus</i> spp.) and cattail ( <i>Typha</i> spp.) as well as riparian willow ( <i>Salix</i> sp.) thickets. These song sparrows also nest in riparian forests of Valley Oak ( <i>Quercus lobata</i> ) with a sufficient understory of blackberry along vegetated irrigation canals and levees and in recently planted Valley Oak restoration sites.	<b>High.</b> Wetland areas within the study area provide potential nesting and foraging habitat. This species was observed during surveys.

Common and Scientific Name	Status <sup>a</sup> (Federal/State)	Habitat/Range/Life History <sup>b</sup>	Potential for Occurrence
<b>Birds</b>			
Purple martin <i>Progne subis</i>	-/SSC/-	Widely but locally distributed in forest and woodland areas at low-to-intermediate elevations throughout California. Breeds in Northern California, primarily along the coast. Nests in buildings and riparian habitats and have persisted by nesting in hollow-box bridges.	Low. Buildings and other structures are not present within the study area. This species is not expected to occur within the study area and was not observed during surveys.
<b>Bank swallow</b> <b><i>Riparia riparia</i></b>	-/ST/-	Nesting colonies only occur in vertical banks or bluffs of friable soils suitable for burrowing by these small birds. Nests throughout California.	<b>High.</b> Suitable nesting habitat occurs adjacent to the study area. There is a known nesting colony on the bank of the Sacramento River opposite the Fremont Weir. This species was observed during surveys.
Least Bell's vireo <i>Vireo bellii pusillus</i>	FE/SE/-	Structurally diverse woodlands along watercourses, including cottonwood-willow forests, oak woodlands, and mule fat scrub	Low. Diverse woodlands within the study area provide potential habitat, but the study area is outside of the known species range. This species is not expected to occur within the study area and was not observed during surveys.
Yellow-headed blackbird <i>Xanthocephalus xanthocephalus</i>	-/SSC/-	Nests in colonies in dense freshwater emergent wetlands. Also nests and forages in agricultural ditches and slow moving watercourses.	Moderate. Wetland areas within the study area provide potential nesting and foraging habitat. This species has potential to occur within the study area, but was not observed during surveys.

Sources: California Department of Fish and Wildlife 2016a, 2016b; United States Fish and Wildlife Service 2016; Shuford and Gardali 2008

Notes:

Species names that appear in bold indicate species that were observed during surveys.

<sup>a</sup> Status:

Federal

BCC = Federal Bird of Conservation Concern, FC = Candidate Species under the federal Endangered Species Act, FE = Listed as Endangered under the federal Endangered Species Act, FT = Listed as Threatened under the federal Endangered Species Act

State

FP = Listed as Fully Protected under the California Fish and Game Code, SE = Listed as Endangered under the California Endangered Species Act, SSC = Listed as Species of Special Concern by the California Department of Fish and Wildlife, ST = Listed as Threatened under the California Endangered Species Act

<sup>b</sup> Life history information included when necessary to determine the potential for occurrence within the study area or to support the associated impact analysis.

## Mammals

Three special-status mammal species were identified during database queries (Table 3.5-2). All three species were determined to have moderate potential to occur in the study area and include the pallid bat (*Antrozous pallidus*), western red bat, and American badger.

Surveys were conducted by DWR on August 28, 2014, May 28, 2015, and June 3, 2015, to identify potential bat and mammal habitat in the study area (California Department of Water Resources 2014c, 2015c). Occurrence information for these three special-status mammal species is provided below.

*Pallid Bat.* The pallid bat is a California species of special concern. The nearest CNDDDB occurrence is outside the Yolo Bypass, 8.3 miles southeast of Agricultural Road Crossing 3. Suitable pallid bat roosting and foraging habitat is present in open grasslands, snags, and trees in the Upstream Channel, Reach 1, and at the agricultural road crossings. Maternity colonies are typically active May through October. This species was not observed during surveys.

*Western Red Bat.* The western red bat is a California species of special concern. The nearest CNDDDB occurrence is approximately 5 miles north of the existing fish ladder along the Sacramento River. Suitable western red bat roosting and foraging habitat is present in riparian areas at the Upstream Channel, Reach 1, and at the agricultural road crossings. Western red bats mate in August and September; young are typically born in late May and are able to fly by September. This species was not observed during habitat surveys.

*American Badger.* The American badger is a California species of special concern. The nearest CNDDDB occurrence of American badger is approximately 19.5 miles southwest of Agricultural Road Crossing 3. Suitable American badger burrowing and foraging habitat occurs in dry, open areas near the Upstream Channel and Reach 1. American badgers mate in summer and early fall, and young are born in March and April. This species was not observed during surveys.

## Birds

Twenty special-status bird species were identified during database queries (Table 3.5-2). Of these species, four are not expected to occur within the study area because of lack of suitable habitat. The 16 special-status bird species with moderate or high potential to occur in the study area are tricolored blackbird (*Agelaius tricolor*), grasshopper sparrow, short-eared owl (*Asio flammeus*), burrowing owl (*Athene cunicularia*), redhead, Swainson's hawk, mountain plover (*Charadrius montanus*), northern harrier, western yellow-billed cuckoo, white-tailed kite (*Elanus leucurus*), yellow-breasted chat, least bittern, loggerhead shrike (*Lanius ludovicianus*), Modesto song sparrow, bank swallow (*Riparia riparia*), and yellow-headed blackbird (*Xanthocephalus xanthocephalus*).

At least two surveys were conducted by DWR between April 1 and June 30, 2015, to identify bird species and potential habitat in the study area, which included a 0.5-mile buffer from areas of potential ground disturbance (California Department of Water Resources 2015d). Occurrence information for these 16 special-status bird species is provided below.

*Tricolored Blackbird.* The tricolored blackbird is a California species of special concern and was deemed a candidate for California Endangered Species Act (CESA) listing in December 2015. As a candidate for CESA listing, tricolored blackbird has all the legal protections of California threatened and endangered

species. A federal bird of conservation concern, it was a candidate for ESA listing in September 2015. Suitable tricolored blackbird nesting habitat is present in freshwater emergent wetland areas near the agricultural road crossings. Suitable foraging habitat is present in agricultural fields adjacent to the Tule Canal and at the agricultural road crossings. Tricolored blackbirds typically nest from mid-April to late July. Tricolored blackbirds were observed, but nests and nesting behavior were not, in the Fremont Weir Wildlife Area (FWWA) during surveys.

*Grasshopper Sparrow.* The grasshopper sparrow is a California species of special concern. Suitable grasshopper sparrow nesting habitat is present in areas with short-to-middle height, moderately open grasslands with scattered shrubs. This habitat type is located throughout the study area, particularly in the grasslands of the FWWA. This species typically nests from early April to mid-July, with a peak in May and June. The nearest CNDDDB occurrence is approximately 26 miles southwest of Agricultural Road Crossing 3, outside of the bypass. Grasshopper sparrows are known to breed on the valley floor within the Yolo Bypass Wildlife Area (Tsao pers. comm. 2016). Grasshopper sparrows were not observed during surveys.

*Short-eared Owl.* The short-eared owl is a California species of special concern. Suitable short-eared owl nesting habitat is present in open grassland areas in the Upstream Channel, Reach 1, and an area south of Agricultural Road Crossing 3. The short-eared owl can be migratory or a year-round resident in Northern California and Central California and typically nests from early March through July. There are no CNDDDB occurrences of short-eared owls within Yolo County, but this species is known to occur in the Yolo Bypass (eBird 2016); this species was not observed during surveys.

*Burrowing Owl.* The burrowing owl is a California species of special concern and a federal bird of conservation concern. Burrowing owls typically nest from February through August, with the peak in April and May. Suitable burrowing owl nesting habitat is present in grasslands in the Upstream Channel and Reach 1. Regular flooding of the bypass probably reduces the quality of this nesting habitat. The nearest CNDDDB occurrence is approximately 12 miles southeast of Agricultural Road Crossing 3 (outside of the bypass). Burrowing owls have only been recorded in the Yolo Bypass south of Interstate 80, with the nearest CNDDDB occurrence in the bypass approximately 12.5 miles south of Agricultural Road Crossing 3. This species was not observed during surveys.

*Redhead.* The redhead is a California species of special concern. Suitable nesting and foraging habitat is present in wetland areas upstream of Agricultural Road Crossing 2. Nesting occurs from March through August, with the peak in April and May. There are no CNDDDB occurrences of redheads within Yolo County, but this species is known to occur within the Yolo Bypass (eBird 2016). This species was not observed during surveys.

*Swainson's Hawk.* Swainson's hawk is a California threatened species and a federal bird of conservation concern. Suitable Swainson's hawk nesting habitat is present in riparian forest and scrub habitat in the Upstream Channel, Reach 1, and at each agricultural road crossing. Swainson's hawks nest from late March through late August, with peak nesting activity in late May through July. Foraging habitat is present in grasslands in the Upstream Channel, Reach 1, and in agricultural areas near the agricultural road crossings. At least eight Swainson's hawk pairs were observed foraging and nesting within the FWWA during surveys. Swainson's hawks also were observed at the agricultural road crossings, but nests were not.



*Mountain Plover.* The mountain plover is a California species of special concern and a federal bird of conservation concern. Suitable mountain plover wintering habitat is present in the Upstream Channel, Reach 1, and in agricultural areas near the agricultural road crossings. The mountain plover only overwinters in California, typically from September to mid-March. The nearest CNDDDB occurrence is outside the bypass, approximately 4.5 miles west of Agricultural Road Crossings 2 and 3. This species was not observed during surveys.

*Northern Harrier.* The northern harrier is a California species of special concern. Suitable northern harrier nesting habitat occurs in grasslands in the Upstream Channel, Reach 1, and approximately 10.3 miles south of Agricultural Road Crossing 3. Northern harriers nest from April to September, with peak activity from June through July. Northern harriers were observed at the agricultural road crossings during surveys, but nests were not.

*Western Yellow-billed Cuckoo.* The western yellow-billed cuckoo was listed as a California threatened species on June 27, 1971, and was listed as a California endangered species on March 26, 1988. The western yellow-billed cuckoo was listed as threatened under the ESA (79 FR 59991) on November 3, 2014. On August 15, 2014, critical habitat was proposed for the western distinct population segment of the yellow-billed cuckoo (79 FR 48547). The western yellow-billed cuckoo nests from mid-June through August, with most eggs laid from mid-June through mid-July. The nearest proposed critical habitat is found approximately 21 miles north of the project area, in the Sutter Bypass. There is little to no suitable nesting habitat within the study area. Marginal foraging and migratory habitat is present in riparian areas in the Upstream Channel and Reach 1. This species is known to occur near the project area, with the nearest CNDDDB occurrence approximately 0.75 mile west of the existing fish ladder, near a thick stand of riparian trees along the Sacramento River. This species was not observed during surveys.

*White-tailed Kite.* The white-tailed kite is a California fully protected species. Suitable white-tailed kite nesting habitat is present in riparian forest and scrub habitat in the Upstream Channel, Reach 1, and at the agricultural road crossings. Suitable white-tailed kite foraging habitat is present in grasslands in the Upstream Channel, Reach 1, and approximately 10.3 miles south of Agricultural Road Crossing 3. White-tailed kites nest from February to October, with peak nesting activity from May to August. White-tailed kites were observed at the Fremont Weir Wildlife Area and the agricultural road crossings during surveys, but nests were not.

*Yellow-breasted Chat.* The yellow-breasted chat is a California species of special concern. Suitable yellow-breasted nesting habitat is present in riparian scrub areas in the Upstream Channel, Reach 1, and at the agricultural road crossings. The yellow-breasted chat nests from early May through early August with peak breeding activity in June. There are no CNDDDB occurrences of yellow-breasted chats within Yolo County, but this species is known to occur in the Yolo Bypass (eBird 2016) and has been observed at Prospect Island in the southern bypass (Tsao, pers. comm. 2016). This species was not observed during surveys.

*Least Bittern.* The least bittern is a California species of special concern. Suitable least bittern nesting and foraging habitat is present in emergent wetlands upstream of Agricultural Road Crossing 2. Based on limited data, the least bittern arrives on California nesting grounds around late March to May, and lays eggs from mid-April through early July. There are no CNDDDB occurrences of least bitterns within Yolo County, but this species is known to occur in the Yolo Bypass Wildlife Area and was heard on the east

side of FWWA, near County Road 16, in May, 2016 (eBird 2016). This species was not observed during surveys.

*Loggerhead Shrike.* The loggerhead shrike is a California species of special concern. Suitable loggerhead shrike nesting habitat is present in grasslands in the Upstream Channel, Reach 1, and approximately 10.3 miles south of Agricultural Road Crossing 3. Northern California and Central California provide year-round loggerhead shrike habitat. In California, this species lays eggs from March to May, and young become independent in July or August. Loggerhead shrikes were observed in the Fremont Weir Wildlife Area during surveys, but nests were not.

*Modesto Song Sparrow.* The Modesto song sparrow is a California species of special concern. Suitable Modesto song-sparrow nesting and foraging habitat is present in freshwater emergent wetland, riparian forest, and scrub habitat in the Upstream Channel, Reach 1, and at the agricultural road crossings. Nesting usually begins in April. Modesto song sparrows were observed exhibiting territorial behavior in the Fremont Weir Wildlife Area during surveys, but nests were not. This species is common and abundant in the Fremont Weir Wildlife Area.

*Bank Swallow.* The bank swallow was listed as a California threatened species on June 11, 1989. Suitable nesting habitat is present in vertical banks adjacent to the study area. Bank swallows nest from early May through July, with peak activity from mid-April through mid-May. Most juveniles fledge by mid-July (California Department of Fish and Wildlife 2016b). During surveys, a bank swallow colony was observed on the bank of the Sacramento River, opposite the Fremont Weir, approximately 0.5 mile west (upstream) of the existing fish ladder. Approximately 50 individuals and approximately 75 burrows, several with chicks, were observed at this colony.

*Yellow-headed Blackbird.* The yellow-headed blackbird is a California species of special concern. Suitable yellow-headed blackbird nesting and foraging habitat is present in emergent wetlands upstream of Agricultural Road Crossing 2. The yellow-headed blackbird nests from mid-April through late July. The nearest CNDDDB occurrence is approximately 20.5 miles southeast of Agricultural Road Crossing 3, outside the Yolo Bypass. This species was not observed during surveys.

#### 3.5.1.2 Fisheries Resources

##### *Aquatic Habitat and Associated Fish Species*

The project area falls within the designated critical habitat, as defined in ESA section 3 (see section 3.5.2.1 of the Endangered Species Act), for Central Valley steelhead (*Oncorhynchus mykiss irideus*), Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*), and the Southern Distinct Population Segment (Southern DPS) of green sturgeon (*Acipenser medirostris*). The project area also falls within designated essential fish habitat (EFH) (see section 3.5.2.1 Magnuson-Stevens Fishery Conservation and Management Act) for all runs of Chinook salmon. Adult salmonids, green and white sturgeon (*Acipenser transmontanus*), hardhead (*Mylopharodon conocephalus*), Sacramento sucker (*Catostomus occidentalis*), Sacramento splittail (*Pogonichthys macrolepidotus*), Pacific lamprey (*Entosphenus tridentata*), and river lamprey (*Lampetra ayresi*) utilize the Tule Canal as a migratory corridor. Adult Sacramento splittail spawn on the floodplain created during Fremont Weir overtopping events and westside tributary flow. Juvenile native fishes rearing on the Yolo Bypass utilize the open waters of the Tule Canal, as well as off-channel floodplain. Riparian vegetation within the project area

functions as shaded riverine aquatic habitat along Tule Canal when fish species are present, and may temporarily function as shaded riverine aquatic habitat in Reach 1 during overtopping events.

### **Special-Status Fish Species**

The USFWS's IPaC was used to generate a list of federally protected species with the potential to occur in the study area (United States Fish and Wildlife Service 2016). The IPaC search area was drawn around the northern portion of the Yolo Bypass and included records from Yolo, Sutter, and Sacramento counties. The CNDDDB (California Department of Fish and Wildlife 2016a) and DWR's Aquatic Ecology Section, Yolo Bypass Fish Monitoring Database (California Department of Water Resources 2016a) were also queried to create the list of special-status fish species that have the potential to occur within the study area. The CNDDDB search area is described in subsection 3.5.1.1, "Special-Status Terrestrial Species" of the "Terrestrial Biological Resources" section. The Yolo Bypass Fish Monitoring Database, which dates back to 1998, contains DWR catch data from fyke trap, rotary screw trap, and beach seine sampling efforts in the Toe Drain of the Yolo Bypass. DWR staff operates the fyke trap five days per week and conducts beach seine sampling two to four times per month, from October through June, and operates the rotary screw trap five days per week, from January through June. Sampling ceases during the summer months, once native fishes are no longer present.

Fourteen special-status fish species were identified during queries (Table 3.5-3). Of these 15 species, five were determined to have low potential to occur within the study area because of lack of suitable habitat or because the study area is outside their range. The nine special-status fish species with moderate or high potential to occur in the study area are Southern DPS green sturgeon, white sturgeon, Pacific lamprey, river lamprey, Sacramento splittail, Central Valley DPS steelhead, and all four runs (winter-, spring-, fall- and late fall-run) of Chinook salmon. CNDDDB and Yolo Bypass Fish Monitoring Database records indicate that all of these species have been observed within the Yolo Bypass. Additional occurrence information for these species is provided below.

#### Southern DPS of North America Green Sturgeon

The Southern DPS of North American green sturgeon includes all populations south of the Eel River, with the main spawning population in the Sacramento River and some of its tributaries. The Southern DPS of North American green sturgeon was listed as threatened on April 7, 2006 (71 FR 17757), and is designated as a California species of special concern. The Southern DPS of North American green sturgeon presently contains only a single spawning population within the Sacramento River basin, which primarily spawns in the mainstem Sacramento River downstream of Keswick Dam (river mile [RM] 302), but spawning has also been documented in the Feather River downstream of Oroville Dam (National Marine Fisheries Service 2005) and potentially in the Yuba River where adults exhibiting spawning behavior have been observed (Bergman et al. 2011). Critical habitat was designated for the Southern DPS of North American green sturgeon on October 9, 2009, and includes the Sacramento River and the Yolo Bypass (74 FR 52300).

Little is known about the occurrence of green sturgeon in the Yolo Bypass, although at times their presence is known to coincide with that of white sturgeon. Green and white sturgeon have concurrently been stranded and subsequently rescued in the Yolo Bypass following Fremont Weir overtopping events (California Department of Fish and Wildlife 2016c). Accordingly, green sturgeon arrival in the Yolo Bypass is believed to be similar to that of white sturgeon, an assumption that is further corroborated by spawning presence in the upstream Sacramento River (Moyle 2002). While white sturgeon presence in

**Table 3.5-3 Special-Status Fish Species Reviewed and Analyzed for Potential to Occur in the Study Area**

Common and Scientific Name	Status <sup>a</sup> (Federal/State)	Habitat/Range/Life History <sup>b</sup>	Potential for Occurrence
<b>Green sturgeon - southern DPS</b> <i>Acipenser medirostris</i>	FT/SSC	Requires well-oxygenated water between 8 to 14° C. Anadromous species that is found from coastal waters and the San Francisco Estuary, lower San Joaquin River, the Delta, Sacramento River, lower Feather River, and Yolo and Sutter bypasses (Moyle 2002).	<b>High.</b> Migratory habitat is present within the study area. This species has been observed within the study area during adult migration and juvenile rearing/migration.
<b>White sturgeon</b> <i>Acipenser transmontanus</i>	-/SSC	Requires well-oxygenated water between 8 to 14° C. Anadromous species that is found from coastal waters and the San Francisco Estuary, lower San Joaquin River, the Delta, Sacramento River, lower Feather River, and the Yolo and Sutter bypasses (Moyle 2002).	<b>High.</b> Migratory habitat is present within the study area. This species has been observed within the study area during adult migration and juvenile rearing/migration.
Sacramento perch <i>Archoplites interruptus</i>	-/SSC	Lives in wide range of water conditions, but is often found in warm water. Young require aquatic vegetation. Found in slow-moving waters, sloughs, and lakes of the Central Valley, including the Sacramento and San Joaquin rivers.	Low. Suitable habitat may be present within the study area. But this species is likely extirpated from the Delta and consequently is not expected to occur within the study area.
<b>Pacific lamprey</b> <i>Entosphenus tridentata</i>	-/SSC	Adults leave the ocean to spawn in freshwater and juveniles (ammocoetes) and remain in freshwater for as much as several years prior to migrating to the ocean. In freshwater, they are widely distributed throughout mainstem rivers and their associated tributaries along the coast and in the Sacramento Valley.	<b>High.</b> Suitable habitat is present within the study area. This species has been observed within the study area during adult migration and juvenile (ammocoete) rearing/migration.
Delta smelt <i>Hypomesus transpacificus</i>	FT/ST	Found in shallow, open waters with salinity of 2–7 ppt. Found in upper San Francisco Estuary, primarily in Suisun Bay and the Delta downstream of Mossdale (San Joaquin River). Sacramento River populations typically occur downstream of Isleton.	Low. Suitable habitat is not present within the study area. The proposed project is well upstream of designated critical habitat for this species. This species is not expected to occur within the study area.

Common and Scientific Name	Status <sup>a</sup> (Federal/State)	Habitat/Range/Life History <sup>b</sup>	Potential for Occurrence
<b>River lamprey</b> <i>Lampetra ayresi</i>	-/SSC	Adults live in San Francisco Estuary and migrate to fresh water to spawn in Sacramento, San Joaquin, and Napa rivers as well as tributaries of the San Francisco Bay.	<b>High.</b> Suitable habitat is present within the study area. This species has been observed within the study area during adult migration and juvenile (ammocoete) rearing/migration.
Hardhead <i>Mylopharodon conocephalus</i>	-/SSC	Occurs in undisturbed, low- to mid-elevation streams, and mainstem rivers. Found in Sacramento, San Joaquin, and Russian rivers and tributaries.	Low. Suitable habitat is present within the study area. Although this species has been observed in the nearby mainstem Sacramento River, it is rarely observed in the Yolo Bypass. This species is not expected to occur within the study area.
<b>Steelhead - Central Valley DPS</b> <i>Oncorhynchus mykiss irideus</i>	FT/-	Requires well-oxygenated water between 7.8–18° C. Anadromous species that migrates through Sacramento Valley to spawning grounds in the Sacramento-San Joaquin river drainages.	<b>High.</b> Suitable migratory habitat is present within the study area, but spawning habitat does not occur within the study area. This species is known to occur within the study area during adult migration and juvenile rearing/migration.
<b>Chinook salmon - Central Valley spring-run ESU</b> <i>Oncorhynchus tshawytscha</i>	FT/ST	Adults require well-oxygenated water between 8–12.5° C. Anadromous species that migrates through the Sacramento Valley to spawning grounds in the Sacramento River, Feather River, Yuba River, Butte Creek, Battle Creek, Clear Creek, and Beegum Creek tributary to Cottonwood Creek.	<b>High.</b> Suitable migratory habitat is present within the study area, but spawning habitat does not occur within the study area. This species is known to occur within the study area during adult migration and juvenile rearing/migration.
<b>Chinook salmon - Sacramento River winter-run ESU</b> <i>Oncorhynchus tshawytscha</i>	FE/SE	Adults require well-oxygenated water between 8–12.5° C. Anadromous species that migrates through the Sacramento Valley to spawning grounds in the mainstem Sacramento River from Keswick Dam to Red Bluff Diversion Dam.	<b>High.</b> Suitable migratory habitat occurs within the study area, but spawning habitat does not occur within the study area. This species is known to occur within the study area during adult migration and juvenile rearing/migration.

Common and Scientific Name	Status <sup>a</sup> (Federal/State)	Habitat/Range/Life History <sup>b</sup>	Potential for Occurrence
<b>Chinook salmon – fall- and late fall-run ESU</b> <b><i>Oncorhynchus tshawytscha</i></b>	-/SSC	Adults require well-oxygenated water between 8–12.5° C. Anadromous species that migrates through the Sacramento Valley to spawning grounds in Sacramento and San Joaquin rivers and associated tributaries.	<b>High.</b> Suitable migratory habitat is present within the study area, but spawning habitat does not occur within the study area. This species is known to occur within the study area during adult migration and juvenile rearing/migration.
<b>Sacramento splittail</b> <b><i>Pogonichthys macrolepidotus</i></b>	-/SSC	Found in slow-moving waters and dead-end sloughs. Requires marshes or aquatic vegetation for spawning and foraging for young. Endemic to lakes and rivers of the Central Valley, currently confined to the Delta and Suisun Bay regions.	<b>High.</b> Spawning habitat is present within the study area. This species is known to occur within the study area during adult migration and juvenile rearing/migration.
Longfin smelt <i>Spirinchus thaleichthys</i>	FC/ST	Most frequent in the middle-to-bottom of the water column. Tolerates a wide range of salinity. Found in open waters of estuaries along the West Coast. Typically found below Rio Vista.	Low. Potential habitat is present within the study area, but is likely on the edge of the known species' range. This species is not expected to occur within the study area.
Eulachon <i>Thaleichthys pacificus</i>	FT/-	Found in coastal rivers and tributaries of Northern California. Spawns in lower reaches of coastal rivers with moderate water velocities and gravel for spawning. Populations are limited to the Klamath River, Mad River, Redwood Creek, Smith River, and Humboldt Bay tributaries. These populations represent the southernmost boundary of this species.	Low. Potential habitat is not present within the study area. The study area is outside the known species' range. This species is not expected to occur within the study area.

Source: Moyle 2002

Notes: DPS= California Distinct Population Segment, ESU = Evolutionarily Significant Unit, ppt = parts per thousand

Species names that appear in bold indicate species that are known to occur within the study area.

<sup>a</sup> Status:

Federal

FC = Candidate Species under the federal Endangered Species Act, FE = Listed as Endangered under the federal Endangered Species Act, FT = Listed as Threatened under the federal Endangered Species Act

State

FP = Listed as Fully Protected under the California Endangered Species Act, SE = Listed as Endangered under the California Endangered Species Act, SSC = Listed as Species of Special Concern by the California Department of Fish and Wildlife  
ST = Listed as Threatened under the California Endangered Species Act

<sup>b</sup> Life history information included when necessary to determine the potential for occurrence within the project area.

the Yolo Bypass has been well documented as a result of DWR fyke trap efforts in the Toe Drain of the Yolo Bypass, green sturgeon have never been observed in the 18-year history of DWR fyke trap operation (California Department of Water Resources 2016a). Adult green sturgeon may occur in the project area from February through April, with some adults migrating up the nearby Sacramento River as late as June or July (Heublein et al. 2009). Juvenile green sturgeon, migrating south from their upstream spawning/rearing grounds, are unlikely to reverse course and swim up the Yolo Bypass from the southern tidally influenced zone. Even so, outmigrating juvenile green sturgeon may enter the Yolo Bypass if their migration down the Sacramento River coincides with a Fremont Weir overtopping event.

#### White Sturgeon

White sturgeon is a California species of special concern. Spawning populations exist in large rivers, from the Sacramento-San Joaquin river system northward to the Gulf of Alaska, with the most abundant populations in the Sacramento and Feather rivers. Spawning populations are also known to occur in the San Joaquin River during periods of increased flows and high water quality. DWR fyke trap efforts in the Toe Drain of the Yolo Bypass have observed adult white sturgeon presence from January through August, with peak presence between March and April. Juvenile presence in the Yolo Bypass has been observed at low abundance from December through February, with some presence coinciding with Fremont Weir overtopping (California Department of Water Resources 2016a).

#### Pacific Lamprey

Adult Pacific lamprey leave their marine environment and return to freshwater to spawn during the spring and early summer (Brostrom et al. 2010). Adults might remain in fresh water for up to a year before spawning (Beamish 1980). Juveniles, known as ammocoetes, are sedentary filter-feeders that spend several years partially burrowed in the streambed. Upon metamorphosing to their sub-adult form, known as macrophthmia, lampreys begin outmigrating to the ocean, generally during periods of increased flows in the winter and spring (Brostrom et al. 2010). Pacific lamprey have been observed in the Toe Drain of the Yolo Bypass between December and April, with peak presence occurring in February. Adults are occasionally found in the Yolo Bypass, though the majority of rotary screw trap catch is dominated by ammocoetes and macrophthmia during periods of increased flows in the winter and spring months (California Department of Water Resources 2016a).

#### River Lamprey

River lamprey are largely unstudied in California and very little is known about their life history. Adult river lamprey spend 3–4 months in the Pacific Ocean and San Francisco Estuary and its tributaries before moving into freshwater to spawn in the fall and winter. Spawning occurs from February through May in rivers and streams with suitable spawning gravel available. Juveniles (ammocoetes) spend several years in freshwater, feeding in turbid eddies and backwaters (Moyle 2002). Like Pacific lamprey, the majority of river lamprey documented in the Yolo Bypass are juveniles caught in the rotary screw trap during periods of high flow in the winter and spring. River lamprey have been observed in the Yolo Bypass between December and May, with peak presence in January (California Department of Water Resources 2016a).

#### Hardhead

Hardhead occur throughout most of the Sacramento River and San Joaquin River watersheds, from the valley floor to the foothills. They occupy the Yolo Bypass in low abundance. They have been observed in six of the years between 1998 and 2016, with eight individuals being the maximum number observed in a single year (California Department of Water Resources 2016a). Hardhead are likely year-long residents in



the Yolo Bypass in low abundances, as they have been documented seemingly at random in the Yolo Bypass regardless of time of year (California Department of Water Resources 2016a).

#### Central Valley Steelhead

Central Valley steelhead were listed as threatened under the ESA on January 5, 2006 (71 FR 834). The listing includes all naturally spawned populations of steelhead in the Sacramento and San Joaquin rivers and their tributaries, excluding steelhead from San Francisco and San Pablo bays and their tributaries and two artificial propagation programs: the Coleman National Fish Hatchery and Feather River Fish Hatchery steelhead hatchery programs. Critical habitat was designated for Central Valley steelhead on September 2, 2005, and includes the Sacramento River and the Yolo Bypass (70 FR 52488).

Central Valley steelhead enter freshwater following high-flow events in the fall, with peak abundance occurring from late September through October. Fish enter tributaries to complete their spawning migration from December through March, with peaks in January and February (Moyle 2002). Juvenile steelhead spend the first year or two in freshwater. Initially they remain close to their natal streams, heading downstream as they mature before migrating to the ocean where they remain for another one to four years (Shapovalov and Taft 1954).

Adult and juvenile steelhead are known to occur in the Yolo Bypass. Their highly variable and complex life history allows for them to be present in the study area year-round, though presence often coincides with high-flow events from fall through spring. Adult steelhead have been observed between October and April, with peaks in January and February, and juveniles have been observed between January and June, peaking in March. Steelhead are not commonly caught in the Yolo Bypass, and the majority of the catch has been dominated by juveniles (California Department of Water Resources 2016a).

#### Chinook Salmon

Adult and juvenile Chinook salmon are found in the Central Valley at various times throughout the year (Table 3.5-4). Chinook salmon display widely variable life history strategies, and three genetically distinct evolutionarily significant units (ESUs) have been identified by the National Marine Fisheries Service (NMFS) in the Sacramento-San Joaquin drainage: Central Valley fall-run ESU (includes late-fall-run salmon), Central Valley spring-run ESU, and Sacramento River winter-run ESU (Myers et al. 1998). Each life history variation is defined by the timing of their spawning runs.

Central Valley fall-run Chinook salmon are not federally listed or State-listed as threatened or endangered, but are listed as a species of special concern by the California Department of Fish and Wildlife (CDFW).

Central Valley spring-run Chinook salmon were listed as threatened under the ESA on September 16, 1999 (64 FR 50394), and were listed as a California threatened species on February 5, 1999. This ESU consists of all spring-run Chinook salmon occurring in the Sacramento River basin. Critical habitat was designated for Central Valley spring-run Chinook salmon on September 2, 2005, and includes the Sacramento River and the Yolo Bypass (70 FR 52488).

The NMFS designated winter-run Chinook salmon as federally endangered on June 28, 2005 (70 FR 37160); they were listed as a California endangered species on September 22, 1989. Critical habitat for

winter-run Chinook salmon was designated on June 16, 1993 (58 FR 33212) and includes the Sacramento River from Keswick Dam to Chipps Island (RM 0).

Adult Chinook salmon, from two to five years old, migrate from the ocean to spawn in their natal streams. Adult Chinook salmon enter the Yolo Bypass from the south, often straying from the adjoining Sacramento River in response to significant flow pulses coming from the Yolo Bypass. Emigrating juvenile Chinook salmon can enter the Yolo Bypass from the north as floodwaters overtop the Fremont Weir during periods of high flow. Once on the floodplain, juvenile Chinook salmon grow faster than their mainstem-rearing counterparts as a result of greater availability of prey and other favorable rearing conditions on the floodplain, compared with conditions in the mainstem river (Sommer et al. 2001). The increased growth rates likely lead to improved survival rates during both their migration through the Delta and later in the marine environment.

Adult Chinook salmon from each life history type have the potential to be present in the project area during construction. While adults have been documented in the Yolo Bypass each month that sampling has occurred, the majority have been caught between October and December. Although juvenile Chinook salmon are in the Sacramento River throughout the year, they can only access the Yolo Bypass floodplain following a Fremont Weir overtopping event and thus are unlikely to be present in the project area during construction. Juveniles have been observed between December and July, with peak presence occurring between February and April (California Department of Water Resources 2016a).

**Table 3.5-4 Generalized Life History Timing of Central Valley Chinook Salmon Runs**

<b>Central Valley Chinook Salmon Run</b>	<b>Migration Period</b>	<b>Peak Migration</b>	<b>Spawning Period</b>	<b>Peak Spawning</b>	<b>Juvenile Emergence Period</b>	<b>Juvenile Stream Residency</b>
Sacramento River basin Late fall-run	October–April	December	Early January–April	February–March	April–June	7–13 months
Winter-run	December–July	March	Late April–early August	May–June	July–October	5–10 months
Spring-run	March–September	May–June	Late August–October	Mid-September	November–March	3–15 months
Fall-run	June–December	September–October	Late September–December	October–November	December–March	1–7 months

Source: Yoshiyama et al. 1998

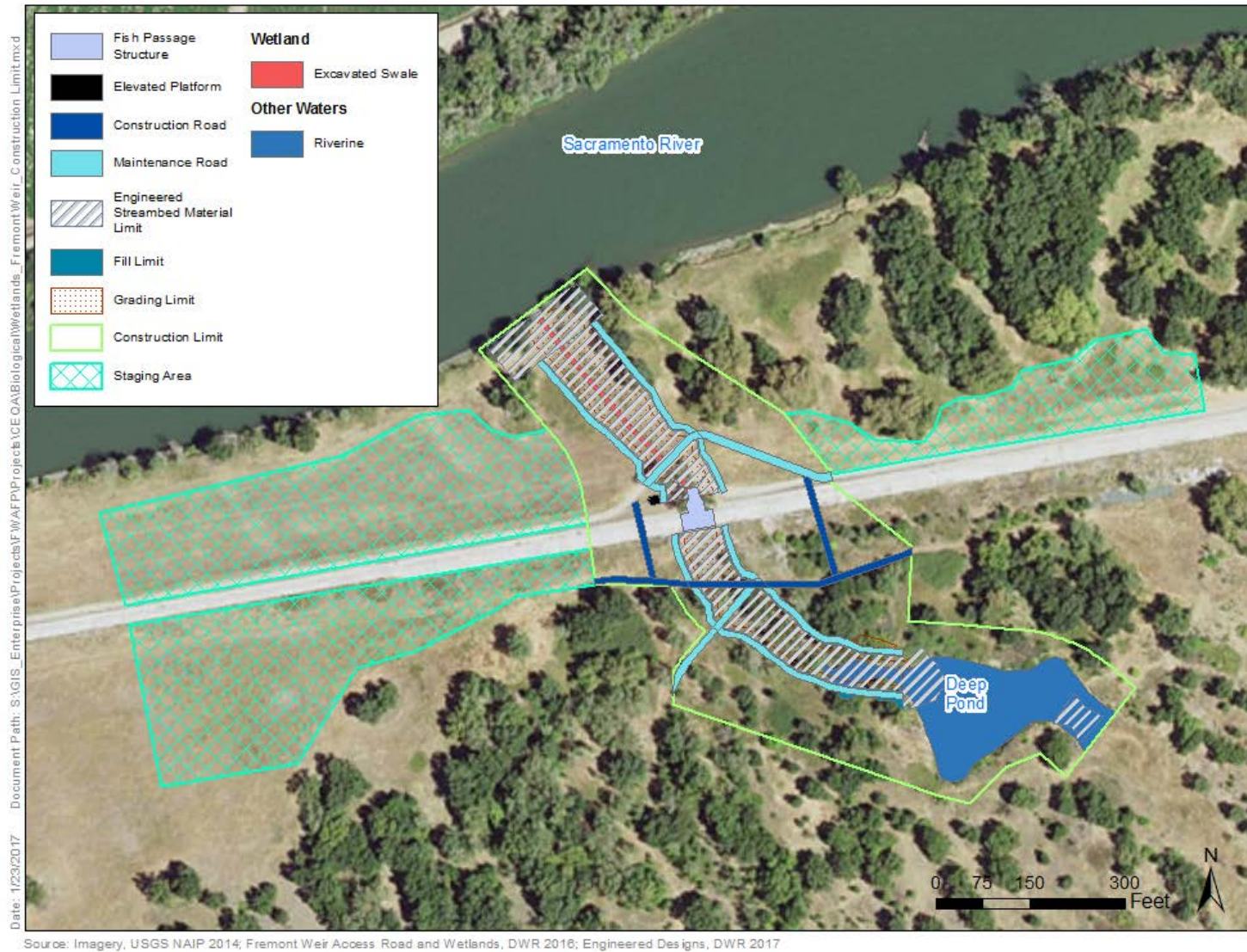
#### Sacramento Splittail

Sacramento splittail were first listed as threatened under the ESA on February 8, 1999, but were delisted on September 22, 2003, based on population trends at that time. This finding was reaffirmed by the USFWS on October 7, 2010. As floodplain spawners, Sacramento splittail benefit substantially from the Yolo Bypass for successful year class recruitment. Adult splittail migrate into the Yolo Bypass from their downstream, estuarine habitats between December and June, with peak presence in February and March, to spawn in newly created floodplains (California Department of Water Resources 2016a; Sommer et al. 1997; Feyrer et al. 2005). Spawning success is strongly correlated to high flows and floodplain inundation, with juvenile abundance peaking between May and June (California Department of Water Resources 2016a; Meng and Moyle 1995; Sommer et al. 1997).

#### **3.5.1.3 Waters of the United States**

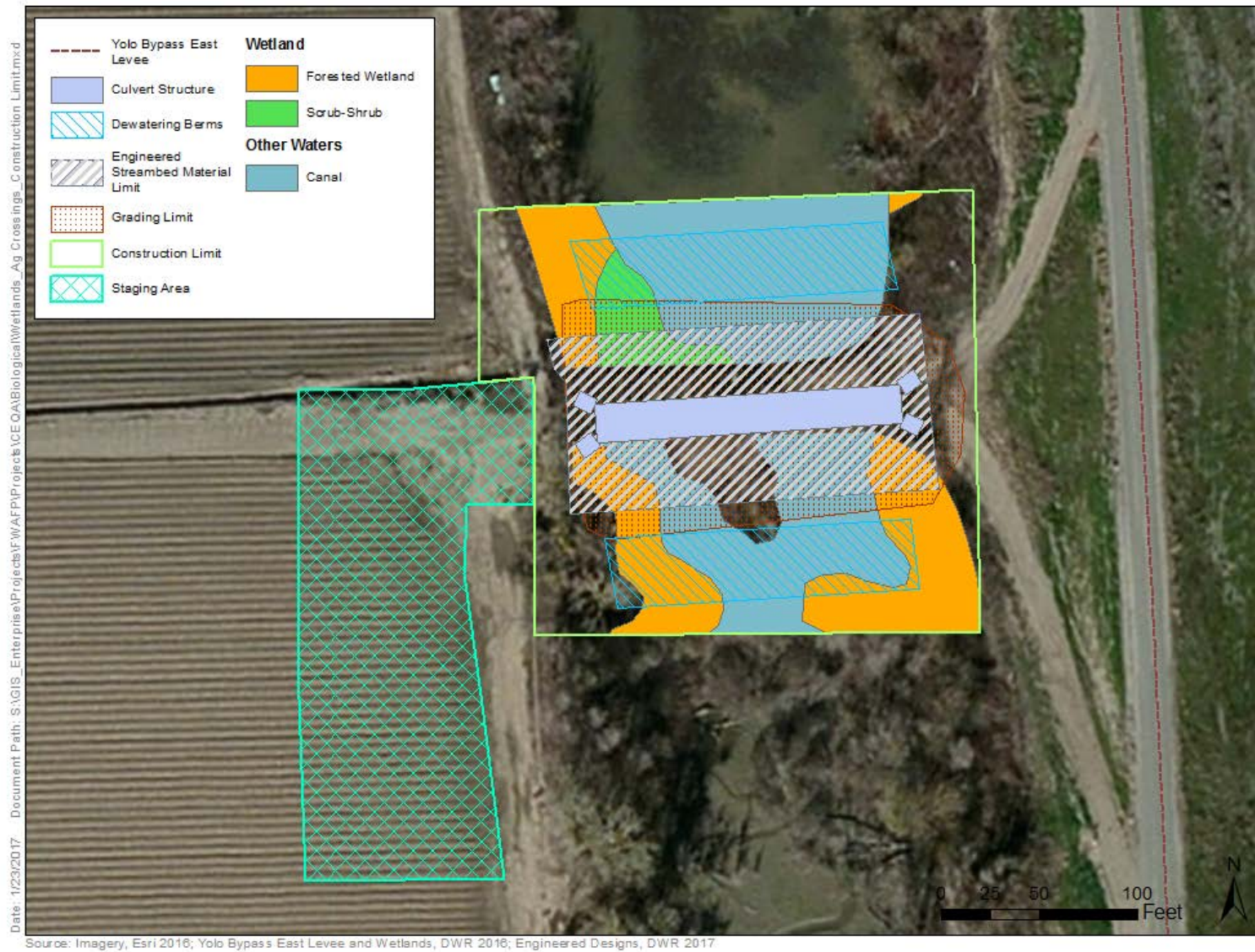
DWR conducted a formal delineation of wetlands and other waters of the United States that may be regulated by the U.S. Army Corps of Engineers (USACE) under the Clean Water Act (CWA) Section 404. Delineation occurred within 133.88 acres of the biological resources study area (review area) that may be subject to ground disturbance during proposed construction activities. Delineation of aquatic features was based on aerial photo interpretation in addition to data that was collected in the field. Site visits were conducted between April 13, 2016, and November 23, 2016, to assess the wetland status and potential USACE jurisdictional authority over various portions of the review area. Research and field investigation resulted in the delineation of 17.09 acres of potential waters of the United States, which includes 1.51 acres of wetlands and 15.57 acres of other waters, within the 133.88-acre review area (California Department of Water Resources 2016b and 2016c). Wetlands and other waters of the United States were mapped at the Upstream Channel, Fremont Weir fish ladder and stilling basin, Reach 1, and Agricultural Road Crossings 2 and 3 (Figures 3.5-3, 3.5-4, and 3.5-5).

**Figure 3.5-3 Wetlands and Other Waters of the United States at the Upstream Channel, Fremont Weir Fish Passage Structure, and Reach 1 in the Proposed Project Area**





**Figure 3.5-4 Wetlands and Other Waters of the United States at Agricultural Road Crossing 2 in the Proposed Project Area**



**Figure 3.5-5 Wetlands and Other Waters of the United States at Agricultural Road Crossing 3 in the Proposed Project Area**





### 3.5.2 Regulatory Setting

#### 3.5.2.1 Federal

##### *Endangered Species Act of 1973*

Section 7 of the ESA requires federal agencies to consult with the USFWS or the NMFS, as appropriate, so that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered fish, wildlife, or plant species, or result in the destruction or adverse modification of designated critical habitat for any such species. Designated critical habitat is defined by the USFWS as specific geographic areas that contain features essential to the conservation of an endangered or threatened species and that may require special management and protection. Critical habitat may also include areas that are not currently occupied by the species but will be needed for its recovery. If a proposed project “may affect” a listed species or destroy or modify critical habitat, the lead agency is required to prepare a biological assessment evaluating the nature and severity of the potential effect. Section 7 also provides a means for authorizing take of threatened or endangered species by federal agencies.

##### *Magnuson-Stevens Fishery Conservation and Management Act*

The amended Magnuson-Stevens Fishery Conservation and Management Act requires that all federal agencies consult with NMFS on activities or proposed activities authorized, funded, or undertaken by that agency, which may adversely affect essential fish habitat (EFH) of commercially managed marine and anadromous fish species. EFH is defined as “waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Chinook salmon freshwater EFH includes all habitat currently or historically occupied by Pacific Fishery Management Council-managed Chinook salmon in the states of Washington, Oregon, Idaho, and California. The entirety of the Yolo Bypass and the Sacramento River are designated as EFH.

##### *Migratory Bird Treaty Act*

The Migratory Bird Treaty Act (MBTA) protects migratory birds and their parts (including eggs, nests, and feathers). The MBTA prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. Projects likely to result in the taking of birds protected under the MBTA require the issuance of take permits from the USFWS. Activities that require such a permit would include, but not be limited to, removal of nests, eggs, and feathers.

##### *Clean Water Act*

#### **Section 404**

Section 404 of the Clean Water Act (CWA) serves as the primary federal law protecting the quality of the nation’s surface waters, including wetlands. Under section 404, the United States Army Corps of Engineers (USACE) and the EPA regulate the discharge of dredged and fill materials into the waters of the United States. These waters are primarily defined as navigable waterways or water features (including wetlands) that have a significant nexus to navigable waters. Project sponsors must obtain authorization from the USACE for all discharges of dredged or fill materials into waters of the United States before proceeding with a proposed activity. Compliance with CWA section 404 requires compliance with several other environmental laws and regulations. The USACE cannot issue an individual permit, nationwide permit, or verify the use of a general permit until the requirements of NEPA, the ESA, the Coastal Zone



Management Act, and the National Historic Preservation Act have been met. Additionally, no permit can be issued or verified until a water quality certification, or waiver of certification, has been issued pursuant to CWA section 401.

### **Section 401**

Under the CWA, section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate.

Accordingly, all projects that have a federal component and may affect state water quality (including projects that require federal agency approval, such as issuance of a section 404 permit) must also comply with section 401.

### *Rivers and Harbors Act of 1899, Section 10*

Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the USACE for the construction of any structure in or over any navigable waters of the United States. The Sacramento River, north of the Fremont Weir, is considered a navigable water of the United States. The law applies to any dredging, excavation, filling, or other modification of a navigable water of the United States, as well as to all structures, including bank protection (e.g., riprap) and mooring structures, such as those in a marina.

### **3.5.2.2 State**

#### *California Endangered Species Act*

CESA establishes the policy of the State to conserve, protect, restore, and enhance threatened or endangered species and their habitats, by protecting “all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, threatened with extinction and those experiencing a significant decline which, if not halted, will lead to a threatened or endangered designation.” It mandates that State agencies not approve a project that would jeopardize the continued existence of these species if reasonable and prudent alternatives are available that would avoid a jeopardy finding. CESA also prohibits the take of any fish, wildlife, or plant species listed as endangered or threatened, or designated as candidates for listing, under CESA. Similar to the federal ESA, CESA contains a procedure for CDFW to issue an incidental take permit authorizing the take of listed and candidate species incidental to an otherwise lawful activity, subject to specified conditions. There are no State agency consultation procedures under CESA. For projects that would affect species that are federally listed and state-listed, compliance with the federal ESA satisfies CESA, if CDFW determines that the federal incidental take authorization is consistent with CESA under section 2080.1. For projects that would result in take of a species that is State-listed only, the project sponsor must apply for a take permit in accordance with section 2081(b).

#### *California Fish and Game Code*

#### **California Fully Protected Species (Sections 3503, 3503.5, and 3513)**

The California Fish and Game Code (CFGF) designates 37 fully protected species (CFGF sections 3511, 4700, 5050, and 5515) and prohibits the take or possession “at any time” of such species, with certain limited exceptions. The CFGF states that “no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to ‘take’ the species”; it also states that no previously issued permits or licenses for take of the species “shall have any force or effect” for authorizing take or possession.

### **Lake and Streambed Alteration (Sections 1600–1603)**

These sections require notifying the CDFW prior to any project activity that would substantially divert or obstruct the natural flow of any river, stream, or lake; substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. This includes ephemeral streams, desert washes, and watercourses with a subsurface flow. It may also apply to work undertaken within the floodplain of a body of water.

### **California Native Plant Protection Act**

The California Native Plant Protection Act (NPPA) (sections 1900–1913 of the California Fish and Game Code) was enacted in 1977 to preserve, protect, and enhance endangered or rare native plants. The NPPA authorizes the Fish and Game Commission to designate plants as rare or endangered and requires all State agencies to use their authority to carry out programs to conserve endangered and rare native plants. The NPPA prohibits importation, take, and sale of native plants determined to be endangered or rare. CESA expands on the NPPA and enhances legal protection for plants, but the NPPA remains part of the CFGC. Since rare plants are not included in CESA, the NPPA is deferred to for protection of plants with these designations.

#### **3.5.2.3 Local**

##### *Yolo County 2030 Countywide General Plan*

The Yolo County 2030 Countywide General Plan (County of Yolo 2009) includes a Conservation and Open Space Element containing goals and policies designed to protect natural resources in perpetuity for the benefit of current and future residents. These resources include water, woodlands, soils, lakes, rivers, fisheries, wildlife, and minerals. The conservation and open space goals and policies provide management guidance for biological resources that may occur in unincorporated lands within the project area.

##### *Yolo County Habitat Conservation Plan/Natural Communities Conservation Plan*

The Yolo Habitat Conservancy (YHC), a Joint Powers Agency consisting of the County of Yolo and the cities of Davis, West Sacramento, Winters, and Woodland, formed in 2002 to begin drafting a habitat conservation plan/natural communities conservation plan (HCP/NCCP) (Yolo Habitat Conservancy 2016). The Yolo County HCP/NCCP will provide the YHC with long-term permits under the federal ESA and the California Natural Community Conservation Planning Act to cover a wide range of public and private activities in Yolo County. The YHC is collaborating with the USFWS and the CDFW to ensure that the biological goals and the conservation measures, which provide protection of the 12 endangered and threatened species and the 15 natural communities they depend on, are covered by the plan.

The second administrative draft of the Yolo County HCP/NCCP, release in March 2015, includes the following biological resources goals and policies (Yolo County HCP/NCCP Joint Powers Authority 2015):

- GOAL CO-2 Biological Resources. Protect and enhance biological resources.
  - Policy CO-2.1 Consider and maintain the ecological function of landscapes, connecting features, watersheds, and wildlife movement corridors.
  - Policy CO-2.3 Preserve and enhance those biological communities that contribute to the county's rich biodiversity including blue oak and mixed oak woodlands, native grassland prairies, wetlands, riparian areas, aquatic habitat, agricultural lands, heritage valley oak trees, remnant valley oak groves, and roadside tree rows.

- Policy CO-2.9 Protect riparian areas to maintain and balance wildlife values.
- Policy CO-2.10 Encourage the restoration of native habitat.
- Policy CO-2.24 Promote floodplain management techniques that increase the area of naturally inundated floodplains and the frequency of inundated floodplain habitat, restore some natural flooding processes, river meanders, and widen riparian vegetation, where feasible.
- Policy CO-2.28 Balance the needs of aquatic and riparian ecosystem enhancement efforts with flood management objectives.
- Policy CO-2.30 Protect and enhance streams, channels, seasonal and permanent marshland, wetlands, sloughs, riparian habitat and vernal pools in land planning and community design.
- Policy CO-2.31 Protect wetland ecosystems by minimizing erosion and pollution from grading, especially during grading and construction projects.
- Policy CO-2.37 Where applicable in riparian areas, ensure that required state and federal permits/approvals are secured prior to development of approved projects.
- Policy CO-2.38 Avoid adverse impacts on wildlife movement corridors and nursery sites (e.g., nest sites, dens, spawning areas, breeding ponds). Preserve the functional value of movement corridors to ensure that essential habitat areas do not become isolated from one another due to the placement of either temporary or permanent barriers within the corridors. Encourage avoidance of nursery sites (e.g., nest sites, dens, spawning areas, breeding ponds) during periods when the sites are actively used and that nursery sites which are used repeatedly over time are preserved to the greatest feasible extent or fully mitigated if they cannot be avoided.
- Policy CO-2.42 Projects that would impact Swainson's hawk foraging habitat shall participate in the Agreement Regarding Mitigation for Impacts to Swainson's hawk Foraging Habitat in Yolo County entered into by the CDFW and the Yolo County HCP/NCCP Joint Powers Agency, or satisfy other subsequent adopted mitigation requirements consistent with applicable local, State, and federal requirements.

The Yolo County HCP/NCCP is in preparation, and as of January 2017, has not yet been adopted.

#### *Yolo Local Conservation Plan*

The Yolo Local Conservation Plan expands on the Yolo HCP/NCCP to cover species and natural communities of local concern not included in the Yolo HCP/NCCP (Yolo Habitat Conservancy 2016). This plan is in preparation and as of January, 2017, has not yet been adopted.

#### *Oak Woodlands Conservation Act*

California State Senate Bill 1334, the Oak Woodlands Conservation Act, became law on January 1, 2005, and was added to the CEQA statutes as Public Resources Code section 21083.4. This statute requires that a county must determine whether or not a project will result in a significant impact on oak woodlands and, if it is determined that a project may result in a significant impact on oak woodlands, then the county shall require one or more of the following four mitigation measures:

1. Conserve oak woodlands through the use of conservation easements.
2. Plant an appropriate number of trees, including maintenance of plantings and replacement of failed plantings.

3. Contribute funds to the Oak Woodlands Conservation Fund for the purpose of purchasing oak woodlands conservation easements.
4. Other mitigation measures developed by the county.

Yolo County developed the Yolo County Oak Woodland Conservation and Enhancement Plan in accordance with the Oak Woodlands Conservation Act as a voluntary program to conserve and enhance the county's existing oak woodlands. But the county does not have specific mitigation requirements for oak tree removal or other oak tree impacts.

### 3.5.3 Environmental Effects

#### 3.5.3.1 No-Action Alternative

Under the No-Action Alternative, no construction activities would occur to enhance fish passage at the Fremont Weir fish ladder, neither in Tule Canal nor in the channels upstream and downstream of the fish ladder. For that reason, there would be no construction-related impacts on fish or wildlife habitat, vegetation communities, or special-status species. Beneficial effects on fish passage also would not occur.

#### 3.5.3.2 Proposed Project Alternative

*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, the U.S. Fish and Wildlife Service, or the National Marine Fisheries Service?*

#### Botanical Resources

**Less than Significant with Mitigation Incorporated.** The project area provides potentially suitable habitat for six special-status plant species. Construction activities within wet or ponded portions of the project area have the potential to adversely affect bristly sedge, Peruvian dodder, woolly rose-mallow, and Sanford's arrowhead. Construction activities within valley grassland portions of the project area also have the potential to adversely affect bristly sedge, as well as woolly-headed lessingia and Baker's navarretia. Adverse effects on these plant species could occur during ground-disturbing activities, as well as dewatering, sedimentation, generation of dust, accidental leaks or spills of fuel or oil, or the accidental introduction of invasive plant species.

These construction-related effects on special-status plant species would be potentially significant. Woolly rose-mallow was the only special-status plant species observed during botanical surveys and is known to occur in and near the study area. In light of the number of nearby occurrences and amount of suitable habitat, loss of individuals in the study area would not be significant to the local population. That said, implementation of the spill prevention and control plan included in Mitigation Measure WQ-2 (refer to section 3.10, "Hydrology and Water Quality"), combined with implementation of the pre-construction surveys, flagging procedures, and best management practices included in Mitigation Measures BOT-1 and BOT-2 would reduce the potential impact to less than significant. Impacts would be further reduced with implementation of the dust control measures included in Mitigation Measure AIR-1 (refer to section 3.4, "Air Quality").

Following completion of construction, operation of the fish passage structure would coincide with Fremont Weir overtopping events between November 1 and May 31. The fish passage structure may be

operated remotely or be accessed by light-duty vehicles. Accessing the fish passage structure on established roads would not affect special-status plant species. During operation of the proposed project, up to an approximate 1,100 cfs would flow through the fish passage structure. This potential increase in flow associated with the project would not alter the frequency or magnitude of inundation in the Yolo Bypass (refer to Figures 3.10-1 through 3.10-3 in section 3.10, “Hydrology and Water Quality”) and thus would not result in changes to, or impacts on, growing conditions, vegetation, or potentially suitable habitat for special-status plant species. The potential operational impact would be less than significant.

Maintenance, such as debris, vegetation, and sediment removal, would be conducted outside of the flood season. Vegetation removal would occur in the Upstream Channel, Reach 1, and at Agricultural Road Crossing 2 within areas of engineered streambed material. Sediment removal would occur in the Upstream Channel and Reach 1. Vegetation and sediment removal has the potential to adversely affect special-status plant species that may have become established during the new growing season. The only special-status plant species known to occur within the biological study area is woolly rose-mallow. In light of the number of nearby occurrences and amount of suitable habitat, loss of individuals in the project area would not be significant to the local population. While maintenance activities could result in an adverse effect on special-status plant species, the potential impact would be less than significant.

**Mitigation Measure BOT-1: Conduct pre-construction surveys for special-status plant species and flag for avoidance.**

A qualified botanist shall conduct surveys for special-status plant species with the potential to occur within the project area prior to construction activities. Specific survey timing shall be based on the bloom period for each special-status plant species. All special-status plant species found during such surveys shall be flagged and avoided to the extent practicable. If avoidance is not practicable, the responsible agency shall be consulted and additional measures to avoid or minimize impacts, such as transplantation, shall be examined. Any additional mitigation measures shall be approved by the appropriate regulatory agencies before the project can proceed.

**Mitigation Measure BOT-2: Prevent the introduction of invasive plant species.**

The construction contractor shall implement the following best management practices, to the extent feasible, to prevent the introduction of invasive plant species:

- Construction equipment with visible plant material or soil shall be washed prior to entering the project area.
- Straw bales and other vegetative materials used for erosion control shall also be certified weed free.
- All re-vegetation materials (e.g., mulches, seed mixtures) shall be certified weed free and come from locally adapted native plant materials, to the extent practicable.

**Wildlife Resources**

**Less than Significant with Mitigation Incorporated.** During construction, special-status wildlife species may be adversely affected, as construction activities would occur in agricultural, grassland, riparian, and aquatic habitat types. Adverse effects on special-status wildlife species could result from accidental leaks or spills of fuel or oil, or from inadvertent sedimentation, within these habitat types during construction. This potential contamination within wildlife habitat would result in a significant impact. However, implementation of the spill prevention and control plan included in Mitigation Measure

WQ-2, as well as the stormwater pollution and prevention plan in Mitigation Measure WQ-3 (refer to section 3.10, “Hydrology and Water Quality”), would reduce this potential impact to less than significant.

Adverse effects could also result from ground-disturbing activities or vehicle strikes, as well as disturbance from noise, dust, or vibration, or through the alteration or loss of habitat. These adverse effects on special-status wildlife species would be potentially significant. Implementation of the environmental awareness training and general wildlife protection measures included in Mitigation Measures WILD-1 and WILD-2, respectively, would reduce the potential impact on all special-status wildlife species that might be present in the project area (Table 3.5-2). Mitigation Measures WILD-3 through WILD-4<sup>22</sup> would provide additional individualized mitigation for specific wildlife species or groups of species that would reduce the potential impact on special-status wildlife species to a less-than-significant level.

**Mitigation Measure WILD-1: Conduct mandatory environmental awareness training for all construction personnel.**

Prior to the start of construction activities, all construction personnel shall participate in mandatory worker environmental awareness training conducted by a qualified biologist. Construction personnel shall be informed about the identification, potential presence, life history, habitat requirements, legal protections, avoidance and minimization measures, and applicable mitigation measures for all special-status species identified in this document as having potential to be adversely affected by this project. Construction personnel shall also be informed of the procedures to follow should a special-status species be encountered within the project area during construction.

**Mitigation Measure WILD-2: Implement general wildlife protection measures during construction.**

The construction contractor shall implement general wildlife protection measures during construction that shall include, but may not be limited to, the following:

- Limit construction activities to daylight hours, to the extent feasible.
- If work extends beyond daylight hours, use portable construction lighting to illuminate the area of construction activity. Confine clearing to the minimal area necessary to facilitate construction activities.
- Clearly delineate the project area limits by using fencing, flagging, or other means prior to the start of construction activities.
- Avoid wildlife entrapment by completely covering, or providing escape ramps for, all excavated steep-walled holes or trenches more than 1 foot deep at the end of each work day.
- Inspect the work area and any equipment or material left on-site overnight for special-status wildlife species prior to the start of construction activities each day.
- Observe posted speed limit signs on local roads and observe a 15-mile-per-hour speed limit along ingress/egress routes.
- Dispose of food-related garbage in wildlife-proof containers and remove the garbage from the construction area regularly during the construction period.
- Retain a qualified biological monitor to be present or on-call during construction activities with the potential to affect sensitive biological resources. The biological monitor shall be on-site during initial ground-disturbing activities. The biological monitor shall ensure that any construction or exclusion fencing is maintained. The biological monitor shall have the authority to stop work if a special-status wildlife species is encountered within the project area during

construction, and the appropriate regulatory agency(ies) shall be notified. Construction activities shall cease until it is determined that the species will not be harmed or that it has left the construction area on its own.

#### Invertebrates

*Valley elderberry longhorn beetle.* No elderberry shrubs were observed within the project area during preliminary habitat assessment surveys, but they are known to occur within the study area. Elderberry shrubs may also occur along existing roads that would be used for construction access. The roads in this area are paved public roads that receive regular traffic from heavy farm equipment and from the public accessing the FWWA. Nonetheless, project-related construction activities and disturbance frequencies would not be significantly different from the baseline of activity along the road. The proposed project could result in adverse effects on the valley elderberry longhorn beetle if elderberry shrubs with one or more stems measuring 1 inch or greater in diameter at ground level are present and removal is necessary, or if construction activities result in construction-generated dust or root damage or compaction to elderberry shrubs of this size. If elderberry shrubs with one or more stems measuring 1 inch or greater in diameter at ground level are discovered within the project area, construction activities would result in a potentially significant impact. With implementation of Mitigation Measure WILD-1 and the avoidance, relocation, or replacement measures included in Mitigation Measures WILD-3 through WILD-5, the potential impact of construction activities on the valley elderberry longhorn beetle would be reduced to less than significant. Impacts would be further reduced with implementation of the dust control measures included in Mitigation Measure AIR-1 (refer to section 3.4, "Air Quality").

Following completion of construction, operation of the fish passage structure would coincide with Fremont Weir overtopping events between November 1 and May 31. The fish passage structure may be operated remotely or be accessed by light-duty vehicles. Accessing the fish passage structure on established roads would not affect valley elderberry longhorn beetle or its host plant, elderberry. The potential impact would be less than significant.

Maintenance, such as debris, vegetation, and sediment removal, would be conducted outside of the flood season. Vegetation removal would occur in the Upstream Channel, Reach 1, and at Agricultural Road Crossing 2 within areas of engineered streambed material. Annual removal of this vegetation would prevent trees and shrubs from maturing. Sediment removal has the potential to similarly affect small shrubs that may have become newly established. Any elderberry shrubs less than 1 inch in diameter would not provide suitable habitat for the valley elderberry longhorn beetle; therefore, ~~maintenance activities would not affect this species.~~ The potential impact would be less than significant. In the event that the stem of an elderberry shrub was allowed to grow to 1 inch in diameter or greater, maintenance activities would have a potentially significant impact on the valley elderberry longhorn beetle. Implementation of the avoidance and minimization measures included in Mitigation Measure WILD-6 would reduce the level of impact to less than significant.

#### **Mitigation Measure WILD-3: Conduct pre-construction elderberry shrub surveys.**

Prior to the start of construction activities, elderberry shrub surveys shall be conducted within the project area by a qualified biologist. All elderberry shrubs with stems greater than 1 inch in diameter at ground level shall be recorded and marked with flagging for avoidance.



**Mitigation Measure WILD-4: Establish and maintain a buffer zone for elderberry shrubs.**

Elderberry shrubs mapped during surveys shall be avoided to the extent practicable during construction activities. For all elderberry shrubs identified for avoidance, an avoidance buffer of 100 feet or more shall be established prior to construction activities. A 20-foot avoidance buffer shall be established from the dripline of all elderberry shrubs within 50 feet of construction activity. The avoidance buffer shall consist of a physical barrier, such as flagging, exclusion fencing, or K-Rail barriers, and shall be maintained for the duration of project construction. Signs alerting construction workers to the presence of elderberry shrubs shall be placed around the perimeter of the buffer. Signs and fencing shall be posted in accordance with the USFWS's *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (United States Fish and Wildlife Service 1999).

In areas where encroachment into the 100-foot buffer zone is necessary, a minimum setback distance from the dripline of the elderberry plant, to be determined during consultation with USFWS, shall be established. Any damage done within the buffer area during construction shall be restored by providing erosion control. Under this measure, no elderberry shrub with one or more stems 1 inch or greater in diameter at ground level would be disturbed or removed.

**Mitigation Measure WILD-5: Mitigate for elderberry shrubs that cannot be avoided.**

DWR and Reclamation shall identify measures to relocate or replace elderberry shrubs with stems measuring 1 inch or greater in diameter at ground level, if an adequate buffer cannot be provided, if trimming is required, or if a shrub cannot be avoided during construction and must be removed. The mitigation plan shall include transplantation procedures that comply with USFWS's *Conservation Guidelines for the Elderberry Longhorn Beetle* (United States Fish and Wildlife Service 1999). If transplantation is not feasible, USFWS general guidelines require replacement of elderberry plants in designated mitigation areas, at a mitigation ratio determined during consultation with USFWS. Alternatively, mitigation credits may be purchased from an approved mitigation bank. The mitigation plan must be approved by USFWS during formal consultation and may include, but not necessarily be limited to, identified locations for transplanted or replacement elderberry shrubs and the appropriate replacement ratios. USFWS shall be consulted prior to removal, trimming, or thinning of any elderberry shrubs.

**Mitigation Measure WILD-6: Implement avoidance and minimization measures for valley elderberry longhorn beetle during maintenance activities.**

The following measures shall be implemented to avoid or minimize valley elderberry longhorn beetle impacts during maintenance activities:

- Prior to the start of maintenance activities, elderberry shrub surveys shall be conducted within the maintenance area by a qualified biologist. All elderberry shrubs with stems greater than 1 inch in diameter at ground level shall be marked with flagging and a 20-foot avoidance buffer shall be established. These areas will be avoided by all maintenance personnel and maintenance activities.
- Insecticides, herbicides, or other chemicals that might harm the beetle or its host plant shall not be used within the established buffers (20 feet) around elderberry shrubs. Inside established buffers grass and ground cover may be mowed from July to April to reduce fire hazard. Mowing will not

occur within 5 feet of any elderberry stem 1-inch in diameter or greater. Vegetation within 5 feet of any elderberry stem 1-inch in diameter or greater will be removed by hand only.

### Reptiles

*Giant Garter Snake.* Proposed construction activities have the potential to adversely affect giant garter snake individuals through construction activities in aquatic and upland habitat or vehicle strikes. Adverse effects could occur within aquatic areas in Tule Canal and at each agricultural road crossing, as well as in adjacent upland habitat. Construction activities are anticipated to occur between May 1 and November 1, which would overlap with the May 1 to October 1 active season for giant garter snakes. The potential for direct mortality during the active season is lower than during the dormant period because snakes can move to avoid danger. Although construction activities would extend past October 1 (the end of the active season), continuous construction throughout the active season would be likely to deter giant garter snakes from the project area and thus reduce the likelihood of them utilizing the area during the dormant period. Extending the construction period to the November 1 date should allow for the project to be completed in a single year, thereby reducing potential impacts from multi-year construction.

Temporary effects on giant garter snake aquatic habitat would result from placement of the crossing and potential temporary earthen dams at Agricultural Road Crossing 2, earth removal at Agricultural Road Crossing 3, and general construction work within the construction limit at Agricultural Road Crossings 2 and 3. The proposed project would temporarily affect ~~up to~~ approximately 0.75 acre of giant garter snake aquatic habitat. This amount is a small portion of aquatic habitat that would be available in the Tule Canal during construction since the majority of Tule Canal would not be affected during construction.

~~Placement of engineered streambed material would permanently alter the substrate of giant garter snake aquatic habitat. Permanent impacts on giant garter snake aquatic habitat would result from the placement of engineered streambed material at the deep pond and Agricultural Road Crossing 2. Although the placement of engineered streambed material would permanently alter the substrate of giant garter snake aquatic habitat, the altered areas would still provide habitat value for giant garter snake. Placement of engineered streambed material at the deep pond would result in the permanent alteration of approximately 0.08 acre of aquatic habitat at the junction of Reach 1 and the deep pond. The northwestern corner of the deep pond is characterized by steep sides and little emergent vegetation. Currently it may provide marginal habitat for giant garter snakes. The new structure at Agricultural Road Crossing 2 would be smaller than the existing earthen crossing, and the channel would be graded to create a continuous channel bottom in the Tule Canal. As a result, there would be an increase in aquatic habitat at Agricultural Road Crossing 2. The aquatic habitat would consist of 0.03 acre of open aquatic habitat and 0.15 acre of aquatic habitat with engineered streambed material. Placement of engineered streambed material at Agricultural Road Crossing 2 would result in the permanent alteration of approximately 0.10 acre of giant garter snake aquatic habitat. Overall there would be a net increase in 0.18 acre of aquatic habitat at Agricultural Road Crossing 2. Placement of engineered streambed material at Agricultural Road Crossing 2 would result in the permanent loss of approximately 0.10 acre of giant garter snake aquatic habitat. The removal of Agricultural Road Crossing 3 would result in a permanent increase of approximately 0.13 acre of aquatic habitat and would improve habitat connectivity in the Tule Canal. Therefore, the proposed project would not result in a permanent net loss of giant garter snake aquatic habitat, and would result in a beneficial impact resulting from a permanent increase of approximately 0.04 acre of giant garter snake aquatic habitat.~~

The removal of Agricultural Road Crossing 3 would result in a permanent increase of approximately 0.13 acre of aquatic habitat and would improve habitat connectivity in the Tule Canal.

Temporary effects on giant garter snake upland habitat would result from preparing staging areas, grading and general construction work, including vegetation removal, within the construction limits at the deep pond and the agricultural road crossings~~modifying the existing structure at Agricultural Road Crossing 2, and removing Agricultural Road Crossing 3.~~ The proposed project would result in temporary disturbance to approximately ~~1.65~~3.54 acres of giant garter snake upland habitat.

The placement of engineered streambed material in Reach 2 and at the outlet of the deep pond would result in the alteration of approximately 0.36 acre of giant garter snake upland habitat. The proposed maintenance roads along Reach 1 would result in the permanent alteration of approximately 0.09 acre of upland habitat. Currently, this upland habitat is characterized by steep banks, thick grass and herbaceous vegetation, riparian trees and shrubs, and few suitable burrows. The project would result in the alteration of 0.45 acre of upland habitat to engineered streambed material, which would fill in with sediment and some vegetation, and to dirt roads near the deep pond. This altered habitat would continue to provide marginal habitat for basking, similar to existing conditions.

Replacing Agricultural Road Crossing 2 with a culvert structure would result in permanent impacts to 0.08 acre of giant garter snake upland habitat. The placement of engineered streambed material along the edges of the Tule Canal at Agricultural Road Crossing 2 would result in the alteration of approximately 0.06 acre of giant garter snake upland habitat. Since the new structure would be smaller than the existing crossing, 0.18 acre of upland habitat would be converted to aquatic habitat. Currently, vegetation surrounding Agricultural Road Crossing 2 is characterized by emergent aquatic vegetation and moderate to dense riparian vegetation. The placement of engineered streambed material would alter the upland habitat substrate; however, vegetation would be allowed to re-colonize the area. The resulting upland areas would continue to provide habitat, such as basking sites. The placement of engineered streambed material and subsequent natural vegetation growth at Agricultural Road Crossing 2 would not substantially reduce habitat quality from existing conditions.~~The placement of engineered streambed material along the edges of Tule Canal at Agricultural Road Crossing 2 would result in the alteration of approximately 0.21 acre of giant garter snake upland habitat. The placement of engineered streambed material would alter the upland habitat substrate; however, vegetation would be allowed to re-colonize the area. At 0.21 acre, the altered habitat would represent a small portion of available upland habitat in the project vicinity, and upland areas would still provide habitat value for giant garter snake. Therefore, the proposed project would not result in permanent adverse impacts on giant garter snake or its upland habitat~~

The removal of Agricultural Road Crossing 3 would result in a permanent loss of 0.13 acre of upland habitat. This loss is a result of loss of the structure itself, which provides basking sites. The banks of the Tule Canal at this location would not be permanently altered. Any vegetation removed during construction would be allowed to re-colonize naturally and would continue to provide habitat, such as basking sites and burrows. The removal of Agricultural Road Crossing 3 would decrease traffic and result in fewer disturbances to giant garter snake due.

The proposed project would result in alteration to 0.18 acre of aquatic habitat, a net gain of 0.31 acre of aquatic habitat, and improved habitat connectivity in the Tule Canal. The proposed project would result in alteration to 0.51 acre of upland habitat and a permanent loss of 0.39 acre of upland habitat.

Temporary construction-related impacts on giant garter snake aquatic and upland habitat would be potentially significant if the disturbed areas were not restored. With implementation of Mitigation Measures WILD-1 and WILD-2, as well as the avoidance and minimization measures included in Mitigation Measures WILD-76 and WILD-87, these temporary impacts would be reduced to less than significant.

USFWS considers the permanent alteration of substrate to be a permanent loss of habitat for this species. The permanent loss of giant garter snake upland habitat would be a significant impact. Implementation of the compensatory measure in Mitigation Measure WILD-9 would reduce this impact to less than significant.

Following completion of construction, operation of the fish passage structure would coincide with Fremont Weir overtopping events between November 1 and May 31. The fish passage structure may be operated remotely or be accessed by light-duty vehicles. During the giant garter snake inactive period (October 1 to May 1), giant garter snakes would be dormant in upland burrows and likely absent from the Yolo Bypass. Therefore, operation of the fish passage structure would not have a substantial adverse effect on giant garter snakes. The potential impact would be less than significant.

Maintenance, such as debris, vegetation, and sediment removal, would be conducted outside of the flood season, which overlaps with the giant garter snake active period. During this time, giant garter snakes may be active and foraging in aquatic areas and utilizing upland areas in the vicinity. Giant garter snakes may be temporarily disturbed by maintenance activities; however, temporary disturbance during maintenance activities would not have a substantial adverse effect on giant garter snakes. The potential for direct mortality during the active season is lower than during the dormant period because snakes can move to avoid danger; nevertheless, direct mortality would be a significant impact. Giant garter snakes may be temporarily disturbed by maintenance activities; however, temporary disturbance during maintenance activities would not have a substantial adverse effect on giant garter snakes. The potential impact would be less than significant. Implementation of the avoidance and minimization measures included in Mitigation Measure WILD-10 would reduce this potential impact to less than significant.

**Mitigation Measure WILD-67: Implement standard avoidance and minimization measures during construction activities in giant garter snake habitat.**

The following measures shall be implemented to avoid or minimize giant garter snake impacts:

- To the extent possible, work shall be conducted during the giant garter snake active period (May 1 to October 1). Only construction phases that have started prior to October 1 shall continue outside the active season, with CDFW and USFWS approval. No new construction work phases shall be started after October 1.
- A qualified biological monitor shall be onsite during vegetation removal in giant garter snake habitat and during construction activities adjacent to aquatic habitat at the deep pond.
- Prior to the start of construction activities and during the active period for giant garter snakes, the construction contractor shall install exclusion fencing along the edge of construction areas that are within 200 feet of suitable giant garter snake aquatic habitat. The exclusion fencing material shall consist of a material that snakes cannot get through or become entangled in and buried at least six inches below ground to prevent animals from entering below the fence. The exclusion fence shall be regularly inspected and maintained throughout project construction. If work extends beyond October 1, the exclusion fencing shall be maintained to prevent giant

- garter snakes from entering the construction limit and utilizing upland areas for overwintering.
- Vegetation clearing within 200 feet of the banks of suitable giant garter snake aquatic habitat shall be confined to the minimal area necessary to facilitate construction activities. Movement of heavy equipment shall be confined to existing roadways, ~~to the maximum extent possible or~~ temporary construction access roads established during construction.
- A USFWS- and CDFW-approved biologist shall conduct pre-construction surveys in suitable giant garter snake habitat a maximum of 24 hours prior to the start of construction activities. If there is a lapse in construction activities of two weeks or greater, the construction area shall be resurveyed a maximum of 24 hours prior to recommencement of work.
- If a giant garter snake is encountered during construction, USFWS and CDFW shall be notified and activities shall cease until appropriate corrective measures have been completed or it is determined that the snake will not be harmed. If possible the snake should be allowed to leave on its own and activities shall not resume until the snake has moved out of the area on its own. Alternatively, the qualified biologist may capture and relocate the snake unharmed to suitable habitat at least 200 feet from the construction area. If the snake does not leave on its own and cannot be relocated unharmed, construction activities within approximately 200 feet of the snake will stop to prevent harm to the snake, and USFWS and CDFW will be consulted to identify next steps. USFWS and CDFW will be notified by telephone or email within 24 hours of a giant garter snake observation during construction activities.
- After April 15, any dewatered habitat shall be allowed to dry (no standing water) for at least 15 consecutive days prior to excavating or filling of the dewatered habitat.

**Mitigation Measure WILD-78: Restore temporarily disturbed giant garter snake aquatic and upland habitat after construction completion.**

After completion of construction activities, the construction contractor shall remove any temporary fill and construction debris from the channel. Temporarily disturbed upland areas shall be reseeded with native seed mix, and channel vegetation shall be allowed to recolonize. Under this measure, temporary construction activities would not result in the permanent loss of giant garter snake aquatic and upland habitat.

**Mitigation Measure WILD-9: Compensate for permanent loss of giant garter snake habitat.**

The permanent loss of giant garter snake habitat shall be compensated for by purchasing credits at a USFWS- and CDFW-approved conservation or mitigation bank. Mitigation ratios shall be determined in coordination with USFWS and CDFW during the permitting process to mitigate for adverse habitat alteration or loss of giant garter snake habitat.

**Mitigation Measure WILD-10: Implement avoidance and minimization measure during maintenance activities in giant garter snake habitat.**

The following measures shall be implemented to avoid or minimize giant garter snake impacts during maintenance activities:

- Prior to the start of maintenance activities, all personnel shall participate in mandatory worker environmental awareness training conducted by a qualified biologist. Personnel will be informed about the identification, potential presence, life history, habitat requirements, legal protections,

and avoidance and minimization measures for giant garter snake.

- To the extent possible, work shall be conducted during the giant garter snake active period (May 1 to October 1). Only maintenance phases that have started prior to October 1 shall continue outside the active season, with CDFW and USFWS approval. No new maintenance work phases shall be started after October 1.
- A 15-mile-per-hour speed limit shall be observed on the Fremont Weir maintenance road, levee access roads, and at Agricultural Road Crossing 2. Observing a 15 mile-per-hour speed limit will allow personnel in vehicles to see and avoid giant garter snakes that may be present on the roads.
- A qualified biologist shall be available on an on-call basis during project-related maintenance activities with the potential to affect giant garter snake. If needed, a qualified biologist shall be maintained on-site during maintenance activities to ensure the protection of giant garter snake. The biological monitor shall have the authority to stop work if a giant garter snake is encountered within the project area during maintenance.
- If a giant garter snake is observed in the maintenance area, all activities shall cease and a qualified biologist shall be notified immediately. If possible the snake shall be allowed to leave on its own and activities shall not resume until the snake has moved out of the area on its own. Alternatively, the qualified biologist may capture and relocate the snake unharmed to suitable habitat at least 200 feet from the maintenance area. If the snake does not leave on its own and cannot be relocated unharmed, maintenance activities within approximately 200 feet of the snake shall stop to prevent harm to the snake, and USFWS and CDFW shall be consulted to identify next steps. USFWS and CDFW shall be notified by telephone or email within 24 hours of a giant garter snake observation during maintenance activities.

*Western Pond Turtle.* Construction activities have the potential to adversely affect western pond turtles through disturbance, loss of aquatic or upland habitat, vehicle strikes, or destruction of active pond turtle nests. Temporary effects on western pond turtle aquatic habitat would result from placement of engineered streambed material in the deep pond, placement of engineered streambed material and potentially of temporary earthen dams at Agricultural Road Crossing 2, and earth removal at Agricultural Road Crossing 3.

Temporary effects on western pond turtle upland habitat would result from constructing staging areas and access routes, establishing borrow and spoil sites, modifying intermittently wetted channels, modifying existing structures at the Fremont Weir and Agricultural Road Crossing 2, constructing an equipment platform at Fremont Weir, and removing the earthen Agricultural Road Crossing 3. Although the placement of engineered streambed material would permanently alter the substrate of aquatic and upland habitat, it would not result in a loss of habitat because the altered habitat would still be suitable for the western pond turtle. The removal of Agricultural Road Crossing 3 would result in a beneficial increase of aquatic habitat and would improve habitat connectivity. The proposed project would not result in permanent adverse effects on the western pond turtle or its habitat.

The impact of construction activities on western pond turtles would be potentially significant; however, with implementation of Mitigation Measures WILD-1 and WILD-2 and the pre-construction surveys and relocation measures included in Mitigation Measures WILD-8<sup>11</sup> and WILD-9<sup>12</sup>, the potential impact would be reduced to less than significant.

Following completion of construction, operation of the fish passage structure would coincide with Fremont Weir overtopping events between November 1 and May 31. During this time, western pond turtles may be nesting, foraging, or migrating through the vicinity. The fish passage structure may be operated remotely or be accessed by light-duty vehicles. Western pond turtles may be temporarily disturbed by the presence of vehicles or humans during operations. This temporary disturbance would not have a substantial adverse effect on western pond turtles. The potential impact would be less than significant.

Maintenance, such as debris, vegetation, and sediment removal, would be conducted outside of the flood season. During this time, western pond turtles would be active and may be nesting, foraging, and basking in the vicinity. The potential for direct mortality during the active period is lower than during the dormant period because western pond turtles can move to avoid danger. Western pond turtles may be temporarily disturbed by the presence of vehicles or humans during maintenance activities. Temporary disturbance during maintenance activities would not have a substantial adverse effect on western pond turtles. The potential impact would be less than significant.

**Mitigation Measure WILD-811: Conduct pre-construction surveys for western pond turtle.**

A qualified biologist shall conduct pre-construction surveys for western pond turtle in suitable upland and aquatic habitat within 48 hours prior to the start of construction activities. If there is a lapse in construction activities of two weeks or greater, the area shall be resurveyed within 24 hours prior to recommencement of work.

**Mitigation Measure WILD-912: Relocate western pond turtles observed within the project area during construction.**

If western pond turtles are observed within the project area during project construction, CDFW shall be notified and construction activities in the vicinity shall cease until protective measures are implemented or it is determined that the pond turtle will not be harmed. If it is determined that the pond turtle would be harmed by continued construction activities, a qualified biologist shall move the western pond turtle to a suitable location outside of the project area.

#### Mammals

*Special-Status Bat Species.* Construction activities would disturb grassland habitat, which provides foraging habitat for the pallid bat and for the western red bat (when associated with riparian habitat). Nevertheless, disturbance within grassland habitat would be temporary, and grassland areas would be restored following completion of construction.

Potential roosting and foraging habitat for the western red bat is located in stands of mature riparian trees near the existing fish ladder and the deep pond, and at the agricultural road crossings. Riparian vegetation might also provide temporary roosting habitat for foraging pallid bats. Construction activities are anticipated to occur in these areas between May 1 and November 1, a time frame that would overlap with the bat maternity season (generally May 1 to August 31). Tree removal in riparian habitat has the potential to adversely affect breeding and nonbreeding bats because of the loss of established roosts and potential roosting habitat. Adverse effects on breeding and nonbreeding bats could also result from general disturbance, including exposure to noise, vibration, and dust.



While construction activities would generally occur during daylight hours, some work may extend into non-daylight hours. Work conducted during daylight hours would not be expected to affect these nocturnal species; however, work during non-daylight hours could result in adverse effects on foraging bats through exposure to noise, vibration, and artificial light.

Construction-related tree removal or disturbance in riparian habitat, and work during non-daylight hours would have a potentially significant impact on special-status bat species. That said, the potential impact would be reduced to less than significant with implementation of Mitigation Measures WILD-1 and WILD-2, as well as the avoidance and protective measures included in Mitigation Measures WILD-~~40~~13 through WILD-~~43~~16.

Following completion of construction, operation of the fish passage structure would coincide with Fremont Weir overtopping events between November 1 and May 31. During this time, special-status bat species may be roosting or foraging in the vicinity. The fish passage structure may be operated remotely or be accessed by light-duty vehicles. The fish passage structure would likely be operated during daylight hours and operation is not expected to affect these nocturnal species. This potential impact would be less than significant.

Maintenance, such as debris, vegetation, and sediment removal, would be conducted outside of the flood season. During this time, special-status bat species may be roosting and foraging in the vicinity. Vegetation removal would occur in the Upstream Channel, Reach 1, and at Agricultural Road Crossing 2 within areas of engineered streambed material. Annual removal of this vegetation would prevent trees and shrubs from maturing to a size that would provide suitable potential roosting habitat. Therefore, removal of newly established vegetation would not adversely affect bat roosting habitat. Sediment removal would have a similar effect on newly established vegetation. Maintenance activities would occur during daylight hours and are not expected to affect these nocturnal species. This potential impact would be less than significant.

**Mitigation Measure WILD-~~40~~13: Conduct pre-construction surveys for western red bat and pallid bat.**

A qualified biologist shall conduct pre-construction surveys for western red bat, pallid bat, and roosts within 48 hours prior to the start of construction activities. If there is a lapse in construction activities of two weeks or greater, the area shall be resurveyed within 24 hours prior to commencement of work.

**Mitigation Measure WILD-~~41~~14: Establish and maintain a buffer zone for known bat roosts in trees that do not need to be removed.**

If a bat roost is present in a tree that does not need to be removed from within the project area, a qualified bat biologist shall establish a no-disturbance buffer (typically 100 feet) and that buffer shall be maintained throughout project activities. If a maternity roost is identified, a no-disturbance buffer shall be established and maintained until a qualified biologist determines that the roost is no longer active.

**Mitigation Measure WILD-~~42~~15: Implement protective measures during removal of trees ~~with~~ that provide suitable bat roosting habitat.**

All removal of trees that provide suitable bat roosting habitat (such as trees with deep bark crevices, snags, or holes) shall be conducted between ~~September 1~~ August 15 and October 30, or earlier than

October 30 if evening temperatures fall below 45 degrees Fahrenheit and/or more than ½" of rainfall occurs within 24 hours. If the pre-construction surveys, as mentioned in WILD-13, identify a tree with bats that could potentially be a nursery roost, that tree shall be removed between August 30 and October 30. These dates which corresponds to a time period when bats would not be caring for non-volant young and have not yet entered torpor. If a non-maternity roost is found in a tree that must be removed or trimmed between September 1 and October 30, a qualified biologist shall monitor tree removal/trimming of trees that provide suitable bat roosting habitat. Tree removal/trimming shall occur over two consecutive days. On the first day in the afternoon, limbs and branches shall be removed using chainsaws only. Limbs with cavities, crevices, or deep bark fissures shall be avoided, and only branches or limbs without those features shall be removed. On the second day, the entire tree shall be removed. Prior to tree removal/trimming, each tree shall be shaken gently and several minutes shall pass before felling trees or limbs to allow bats time to arouse and leave the tree. The biologist shall search downed vegetation for dead or injured bat species and report any dead or injured special-status bat species to CDFW.

**Mitigation Measure WILD-13~~16~~: Implement protective measures for work during non-daylight hours in bat habitat.**

If project activities must occur during non-daylight hours, a qualified biologist shall establish monitoring measures, including frequency and duration, based on species, individual behavior, and type of construction activities. Night lighting should be used only within the portion of the project actively being worked on, and focused directly on the work area. This measure would minimize visual disturbance and allow bats to continue to utilize the remainder of the area for foraging and night roosting. If bats are showing signs of distress, work activities shall be modified to prevent bats from abandoning their roost or altering their feeding behavior. At any time, the biologist shall have the authority to halt work if there are any signs of distress or disturbance that may lead to roost abandonment. Work shall not resume until corrective measures have been taken or it is determined that continued activity would not adversely affect roost success.

American Badger

Construction activities near the existing fish ladder and in Reach 1 would result in temporary effects on approximately 10 acres of grassland habitat. Ground-disturbing construction activities and the use of vehicles or equipment in grassland habitat would have the potential to harm, displace, or disturb American badgers, and could result in the destruction of American badger dens. Upon project completion, disturbed grassland habitat would be re-planted with a weed-free native seed mix for soil stabilization. Although construction-related disturbance within grassland habitat would be temporary, direct harm or disruption of behavior for American badgers would result in a potentially significant impact. With implementation of Mitigation Measures WILD-1, WILD-2, and WQ-3, as well as the pre-construction surveys and avoidance measures included in Mitigation Measures WILD-14~~17~~ and WILD-15~~18~~, the potential impact would be reduced to a less-than-significant level.

Following completion of construction, operation of the fish passage structure would coincide with Fremont Weir overtopping events between November 1 and May 31. The fish passage structure may be operated remotely or be accessed by light-duty vehicles. Maintenance, such as debris, vegetation, and sediment removal, would occur in the Upstream Channel, Reach 1, and at Agricultural Road Crossing 2 within areas of engineered streambed material. Engineered streambed material would not provide suitable substrate for American badger dens. American badgers are a highly mobile species and can move to avoid danger. American badgers present in the vicinity during maintenance activities may be temporarily

disturbed by the presence of vehicles or humans during operations and maintenance activities. Operation and maintenance activities are not expected to affect American badgers. The potential impact would be less than significant.

**Mitigation Measure WILD-4417: Conduct pre-construction surveys for American badger.**

A qualified biologist shall conduct pre-construction surveys for American badger and dens in suitable habitat at least 48 hours prior to the start of construction activities. If there is a lapse in construction activities of two weeks or greater, the area shall be resurveyed within 24 hours prior to recommencement of work. Potential American badger dens identified in the project area shall be monitored to determine current use. Potentially inactive dens shall be blocked with a one-way door or excavated to prevent use during construction. Blocking with one-way doors, where feasible, is preferable to excavation; potential dens blocked with doors shall be made available to badgers after construction.

**Mitigation Measure WILD 4518: Establish and maintain a den buffer for American badger.**

American badger dens determined to be occupied during the breeding season (February 15 through June 30) shall be flagged, and ground-disturbing activities avoided, within 100 feet to protect adults and nursing young. Buffers may be modified by the qualified biologist, provided the badgers are protected, and shall not be removed until the qualified biologist has determined that the den is no longer in use. If the den is occupied during the non-maternity period and avoidance is not feasible, badgers shall be relocated by first incrementally blocking the den over a three-day period, followed by slowly excavating the den before or after the rearing season (February 15 through June 30). This slow excavation shall be performed either by hand or with mechanized equipment under the direct supervision of a qualified biologist; no more than 4 inches in depth shall be excavated at a time. Any passive relocation of American badgers shall occur only under the direction of a qualified biologist.

**Birds**

Special-Status Bird Species

Construction activities have the potential to adversely affect special-status bird species if activities would result in mortality. Adverse effects on nesting birds could also result from general disturbance, including exposure to noise, vibration, and dust. Effects at the species population levels could result from loss of nesting and foraging habitat. The potential impact on special-status bird species associated with proposed construction activities is discussed below by type of effect.

Nesting Disturbance

Construction activities are anticipated to occur between May 1 and November 1, which would overlap with the nesting season for numerous special-status bird species that may occur within the project area (refer to Table 3.5-2). Construction within riparian, shrub, grassland, agricultural, and wetland habitat during the nesting season could potentially result in adverse effects on special-status migratory birds, shorebirds, and raptors (including the Swainson's hawk), as well as species protected by the MBTA. Construction activities during the nesting season have the potential to result in the destruction of nests and eggs and the mortality of nestlings. General disturbance has the potential to result in the abandonment of nests. The potential impact on nesting special-status bird species could be significant. With implementation of Mitigation Measures WILD-1 and WILD-2, as well as the pre-construction surveys and nest protection buffer and monitoring measures included in Mitigation Measures WILD-4619 through WILD-4821, the potential impact would be reduced to less than significant.

Following completion of construction, operation of the fish passage structure would coincide with Fremont Weir overtopping events between November 1 and May 31. During this time, special-status bird species are unlikely to be nesting in the vicinity. The fish passage structure may be operated remotely or be accessed by light-duty vehicles. Special-status bird species may be temporarily disturbed by the presence of vehicles or humans during operations. This temporary disturbance would not have a substantial adverse effect on nesting special-status bird species. The potential impact would be less than significant.

Maintenance, such as debris, vegetation, and sediment removal, would be conducted outside of the flood season. During this time, special-status bird species may be nesting in the vicinity. Vegetation removal would occur in the Upstream Channel and Reach 1, within areas of engineered streambed material. Special-status bird species may be temporarily disturbed by the presence of vehicles or humans during maintenance activities. Temporary disturbance during maintenance activities would not have a substantial adverse effect on nesting and foraging special-status bird species and the potential impact would be less than significant. In addition, the implementation of Mitigation Measures WILD-4619 through WILD-4821 would provide additional protection to nesting birds during maintenance.

The white-tailed kite is a CDFW fully protected species. Thus, construction activities that may result in the direct mortality of white-tailed kites are prohibited. Avoidance of this species during the nesting season is required. Implementation of the pre-construction surveys and protection measures included in Mitigation Measures WILD-4619 through WILD-4821 would provide sufficient protection during the nesting season and avoid mortality of this species.

**Mitigation Measures WILD-4619: Conduct pre-construction nesting bird surveys for western yellow-billed cuckoo, least Bell's vireo, and migratory birds prior to construction and maintenance activities.**

~~Pre-construction nesting bird surveys shall be conducted by a qualified~~For construction and maintenance conducted between April 1 and August 31, a USFWS-approved biologist ~~in all suitable nesting habitats within the project area~~ shall conduct passive surveys within a minimum of 500 feet of proposed activities to determine the presence of cuckoos and vireos. Nesting surveys shall be conducted in accordance with the recommended timing, methodology, and or/protocol for ~~each bird species~~western yellow-billed cuckoo, least Bell's vireo, and migratory birds, including but not limited to *A Natural History Summary and Survey Protocol for the Western Yellow-billed Cuckoo Population* (Haltermann et al. 2015), and *Least Bell's Vireo Survey Guidelines* (United States Fish and Wildlife Service 2001). Surveys shall also include a 0.25-mile radius outside of the project area for ~~other nesting migratory birds such as Swainson's hawk and western yellow-billed cuckoo,~~ and a 500-foot radius outside of the project area for other nesting migratory birds. Surveys shall be conducted within 14 days prior to the start of construction or maintenance activities, ~~or as prescribed by established survey protocols. If there is a break in construction of one week or more, surveys shall be conducted prior to the re-initiation of construction. If birds or nests are located within this buffer, USFWS will be contacted for further guidance to ensure birds or nests are not disturbed.~~

**Mitigation Measures WILD-4720: Establish nest protection buffers for active bird nests.**

If an active bird nest is located in the survey area, an appropriate nest protection buffer shall be established by a qualified biologist based on the species, type of construction activities, and line of sight

to the work area. Under this measure, nesting birds and offspring would not be disturbed or killed, and nests and eggs would not be destroyed. Work shall be conducted no less than 500 feet from an active raptor nest and 100 feet from an active migratory bird nest, though buffer distances for all nesting birds may differ based on consultation with CDFW and USFWS. To prevent encroachment, the established buffer(s) shall be clearly marked by high-visibility material if it has been determined by the qualified biologist that high-visibility material would not attract predators to the nest site. No construction activities, including tree removal, shall occur within the buffer zone until the young have fledged or the nest is no longer active, as confirmed by the qualified biologist.

**Mitigation Measure WILD-~~18~~21: Monitor active nests within nest protection buffer.**

If project activities must occur within established buffer zones, a qualified biologist shall establish monitoring measures, including frequency and duration, based on species, individual behavior, and type of construction activities. If birds are showing signs of distress within the established buffer(s), work activities shall be modified or the buffer(s) shall be expanded to prevent birds from abandoning their nest. At any time the biologist shall have the authority to halt work if there are any signs of distress or disturbance that may lead to nest abandonment. Work shall not resume until corrective measures have been taken or it is determined that continued activity would not adversely affect nest success.

**Loss of Nesting and Foraging Habitat**

Construction activities and channel widening near the existing fish ladder would result in the temporary disturbance of ~~up to~~ approximately 10 acres of annual grassland (Table 3.5-5) that provide potential foraging habitat for several special-status bird species, including Swainson's hawk and other raptors, and potential nesting habitat for grasshopper sparrow and northern harrier. The temporary disturbance of this nesting and foraging habitat could be significant if it represented the only available grassland and agriculture habitat in the area. Nevertheless, 10 acres of this habitat type represents less than 1 percent of the available grassland and agriculture habitat within the Yolo Bypass and adjacent areas. Therefore, the temporary construction-related disturbance of this potential nesting and foraging habitat would not have a substantial adverse effect on any special-status bird species and would be less than significant. The level of impact would be further reduced by implementing the best management practices for re-vegetation of the disturbed areas, as specified in Mitigation Measure BOT-2.

Construction activities at Agricultural Road Crossings 2 and 3 have the potential to temporarily disturb approximately 1.65 acres of open or vegetated aquatic habitat (Table 3.5-6). Construction activities at the deep pond have the potential to temporarily disturb approximately 0.36 acre of aquatic habitat. When fish are present, this habitat type may provide foraging habitat for fish-eating special-status bird species. But no special-status bird species are directly associated with this habitat type, and the area of temporary disturbance would represent a small amount of the available aquatic habitat within and surrounding the project area. Therefore, the temporary construction-related disturbance of this potential foraging habitat would not have a substantial adverse effect on special-status bird species and would be less than significant.

The existing road crossings are considered agricultural land; however, the road crossings do not provide potential foraging or nesting habitat for birds. Although construction activities and staging areas at Agricultural Road Crossing 2 have the potential to temporarily disturb approximately 0.77 acre of agricultural land, and construction activities at Agricultural Road Crossing 3 have the potential to

permanently remove approximately 0.11 acre of agricultural land, there would be no impact to nesting and foraging habitat for special-status bird species.

Staging areas at Agricultural Road Crossing 3 have the potential to temporarily disturb approximately 0.28 acre of agricultural land that consists of fields or crops, a portion of which may provide potential foraging habitat. The temporary disturbance of this foraging habitat could be significant if it represented the only available grassland or agriculture habitat in the area; however, there are large agricultural foraging areas adjacent to the project area. Therefore, the temporary disturbance of this potential foraging habitat would not have a substantial adverse effect on special-status bird species and would be less than significant.

Construction activities and channel widening near the existing fish ladder would result in the permanent loss of ~~up to~~ approximately 2.34 acres of riparian vegetation (Table 3.5-5) that provides potential nesting habitat for several special-status bird species, including Swainson's hawk and other raptors. Construction at Agricultural Road Crossings 2 and 3 would result in the permanent loss of 0.23 acre and 0.44 acre of riparian habitat, respectively. The permanent loss of this potential nesting habitat would have an adverse effect on special-status bird species and would be potentially significant. Implementation of the compensatory measures for loss of riparian habitat included in Mitigation Measure WILD-~~1922~~ would reduce this impact to a less-than-significant level.

Maintenance, such as debris, vegetation, and sediment removal, would be conducted outside of the flood season. During this time, special-status bird species may be nesting and foraging in the vicinity. Vegetation removal would occur in the Upstream Channel and Reach 1, within areas of engineered streambed material. Annual removal of this vegetation would prevent trees and shrubs from maturing to a size that would provide suitable potential riparian nesting habitat. Therefore, removal of newly established vegetation would not adversely affect nesting habitat. Maintenance activities would not have a substantial adverse effect on nesting and foraging habitat. The potential impact would be less than significant.

**Mitigation Measure WILD-~~1922~~: Compensate for permanent loss of riparian habitat.**

The permanent loss of riparian habitat shall be compensated for by purchasing riparian ~~mitigation~~ credits from ~~an approved bank~~ a USFWS- and CDFW-approved conservation or mitigation bank in compliance with CDFW Lake and Streambed Alteration (Fish and Game Code Section 1600-1603) requirements. Since the project design allows some riparian trees to be avoided, a portion of the impacts will be mitigated before construction begins and the remainder will be mitigated after full impacts are known. Mitigation ratios shall be determined in coordination with CDFW and USACE during the permitting process.

**Table 3.5-5 Acres of Vegetation Communities Potentially Affected by the Proposed Project**

	Fremont Weir	Mt. Meixner Spoil Area	Elkhorn Spoil Area	Ag Road Crossing 2	Ag Road Crossing 3	Total
<b><i>Permanent Impacts</i></b>						
Agriculture	—	—	—	0.08	0.10	<del>0.1023</del> <u>0.18</u>
Grasslands						
Annual grasses and forbs	0.45	—	—	—	—	<del>0.5196</del> <u>0.45</u>
Annual grasses and forbs, non-native/ornamental grasses	0.52	—	—	—	0.03	<del>1.3092</del> <u>0.55</u>
Riparian						
Fremont cottonwood	1.15	—	—	0.23	0.44	<del>1.8413</del> <u>1.82</u>
Riparian mixed hardwood	—	—	—	—	—	—
Valley oak	1.19	—	—	—	—	<del>1.6960</del> <u>1.19</u>
Black willow thicket	—	—	—	—	—	—
Total Permanent	3.31	—	—	0.31	0.57	<del>5.4684</del> <u>4.19</u>
<b><i>Temporary Impacts</i></b>						
Agriculture	—	—	62.17	0.77	0.39	<del>63.1308</del> <u>63.33</u>
Grasslands						
Annual grasses and forbs	5.79	1.06	—	—	—	<del>6.8338</del> <u>6.85</u>



	Fremont Weir	Mt. Meixner Spoil Area	Elkhorn Spoil Area	Ag Road Crossing 2	Ag Road Crossing 3	Total
Annual grasses and forbs, non-native/ornamental grasses	4.60	7.61	0.08	0.19		<del>12.4252</del> 12.48
Riparian						
Fremont cottonwood	—	—	—	—	—	—
Riparian mixed hardwood	—	—	—	—	—	—
Valley oak	—	—	—	—	—	—
Black willow thicket	—	—	—	—	—	—
Total Temporary	10.39	8.67	62.25	0.96	0.39	<del>82.3900</del> 82.66

### Fisheries Resources

**Less than Significant with Mitigation Incorporated.** During construction, the proposed project has the potential to adversely affect special-status fish species. Modification of the fish passage structure and one agricultural road crossing, as well as removal of one agricultural road crossing, is anticipated to occur between May 1 and November 1. Although the abundance of most sensitive fish species in the Tule Canal are positively correlated with periods of high flow in the winter and spring months, there is potential for sensitive fish species to be present year-round in the Tule Canal. The May 1 to November 1 work window was selected to minimize effects on special-status fish species by avoiding the peak migration of special-status fish species, but construction activities within Tule Canal cannot be timed to avoid all life stages of special-status fish species. During the proposed construction work window, the fish passage structure, the Upstream Channel, and Reach 1 would be dry; thus, construction activities at these sites would not have the potential to adversely affect fish species. Nonetheless, the modifications proposed at each of the agricultural road crossings would require in-water construction in the perennially wetted Tule Canal, potentially including construction of temporary earthen dams and construction site dewatering. The potential impact on special-status fish species associated with these in-water activities is discussed below by type of effect.

### Water Quality

Potential water-quality contamination could occur from leakage or accidental spills of petroleum products during construction. Toxic substances, such as gasoline, lubricants, and other petroleum-based products, can kill fish and other aquatic organisms through exposure to lethal concentrations or exposure to non-lethal levels that cause physiological stress and increased susceptibility to other sources of mortality. If

any of these toxic substances were to enter Tule Canal during construction, effects on special-status fish species may be potentially significant, depending on concentration. Implementation of the spill prevention, control, and countermeasure plan included Mitigation Measure WQ-2 (refer to section 3.10, “Hydrology and Water Quality”) would reduce the impact to less than significant.

Potential construction of temporary earthen dams and the subsequent pumping of water during the dewatering effort within the Tule Canal may temporarily increase suspended sediment load and turbidity downstream of the construction sites. The construction window would occur in the warmer summer months when high flows are historically unlikely to occur in the Tule Canal. Low flow conditions would allow suspended sediment to settle more rapidly. Turbidity and suspended sediment levels therefore are not expected to reach levels associated with direct injury or mortality of fish, but may cause behavioral responses in fish, such as interruption of feeding, seeking refuge, or temporarily vacating the construction site until turbidity and suspended sediment levels begin to decrease. These potential behavioral changes would not be considered a substantial adverse effect and would be less than significant. Implementation of the spill prevention plan, stormwater pollution and prevention plan, ~~construction best management practices~~, and turbidity monitoring program included in Mitigation Measures WQ-32, WQ-43, and WQ-54 (refer to section 3.10, “Hydrology and Water Quality”) would assure that the potential water quality impact remains less than significant.

#### Noise

Temporary earthen dams would be used in place of sheet piles for dewatering Agricultural Road Crossing 2. As a result, excessive underwater noise is not anticipated. Adverse, noise-related effects from above- and below-water construction and equipment are expected to be minimal and less than significant. Implementing awareness training and avoidance measures and adhering to the sound-level minimization measures included in Mitigation Measures WILD-1 and FISH-1 would further reduce the level of significance.

Potential effects on fish as a result of increased underwater noise include abnormal behavioral modifications, injury in the form of tissue damage of both auditory and non-auditory tissues, and in some cases direct mortality. The degree of damage depends on the species’ size and the presence or absence of a swimbladder and other associated bodily structures linking the swimbladder to hearing structures (Popper and Hastings 2009). In an effort to describe the effects of vibratory driving on various fish species, Hastings (2010) classified fish species into the following hearing categories: hearing generalists (e.g., Chinook salmon and steelhead), hearing specialists (e.g., Sacramento splittail), and species with low hearing sensitivity (e.g., green and white sturgeon, Pacific lamprey, and river lamprey). Of the hearing groups in the study, hearing specialists were more sensitive to the effects of vibratory pile driving and thus were more prone to injury during vibratory pile driving. ~~To avoid such effects, temporary earthen dams would be used in place of in-water pile or vibratory driving.~~

Although their respective susceptibility to noise-related injury varies, each of the aforementioned species is large enough to vacate areas of high noise levels. Salmonids are large enough and have high enough accumulated sound exposure thresholds that they would be unlikely to be significantly affected by pile driving. As hearing specialists, Sacramento splittail may be susceptible to temporary hearing loss in the unlikely event that they remained in the vicinity of the pile driving for prolonged periods. Low sound-sensitivity species, such as green and white sturgeon and various lamprey species, would not likely suffer hearing loss or auditory tissue damage (Hastings 2010). ~~Utilizing temporary earthen dams in place of~~

~~sheet piles, implementing awareness training and avoidance measures, and adhering to the sound level minimization measures included in Mitigation Measures WILD-1 and FISH-1 would reduce this potential impact to less than significant.~~

Demolition of concrete and installation of sheet pile walls during construction of the Fremont Weir fish passage structure would occur 360 feet away from the Sacramento River and 425 feet away from the deep pond. Driving sheet piles is estimated to take 20 hours of impact hammering to complete. It is estimated that each strike of the impact hammer will push down the sheet pile 0.25 inches and that there would be three seconds between strikes. At this rate, each sheet pile would take 1,200 strikes and one hour to install to a depth of 25 feet. It would take 12,000 strikes per day to install 20 sheet piles over the course of two days.

The Sacramento River near the Fremont Weir experiences recreational boat traffic. Based on reported ambient underwater sound levels recorded at various open water locations in the western United States, the expected underwater ambient sound level could range from 114 to 135 decibels root mean square. The ambient noise in the deep pond is expected to be far less, since the pond does not experience boat traffic.

The Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish estimates the peak pressure impact driving of steel sheet piles to be 205 decibels measured 33 feet from the pile (California Department of Transportation 2015). The root mean square is anticipated to be 190 decibels 33 feet from the site. The sound exposure level is estimated to be 180 decibels 33 feet from the site.

These values exceed the threshold that affects fish behavior; however, sound pulses would be highly attenuated as they propagate through bottom sediments towards open water. In addition, the location of the pile driving would occur outside the 200-foot distance in the technical guidance that California Department of Transportation provides for evaluating the hydroacoustics of pile driving on fish (California Department of Transportation 2015). Building on this guidance, because the affected area of the pile driving is not expected to extend beyond 200 feet, noise impacts in the Sacramento River or deep pond would be less than significant.

**Mitigation Measure FISH-1: No work shall be done during a Fremont Weir overtopping event.**

Though unlikely to occur during the May 1 through November 1 work window, work shall be suspended in the event that a Fremont Weir overtopping is forecast to occur, to reduce the likelihood of encountering special-status fish species that may be drawn into the Yolo Bypass during an overtopping event.

**Stranding**

Fish in the immediate vicinity of the dewatered sites have the potential to become stranded and ultimately perish as a result of suffocation, desiccation, or physical injury during the dewatering process. During construction, the drawdown of the deep pond downstream of Reach 1 is not anticipated to negatively affect fish. The lowest pond bottom elevation surveyed was a negative 5.5 feet, so dewatering to below 17 feet would leave more than 20 feet of depth for fish. Dewatering may not be necessary in the Tule Canal because of low seasonal flows. Nevertheless, special-status fish species could potentially be stranded as a result of construction dewatering activities, particularly in the vicinity of the agricultural road crossings in

the Tule Canal. Implementation of the fish rescue efforts included in Mitigation Measure FISH-2 would reduce this potential impact to less than significant.

**Mitigation Measure FISH-2: Conduct fish rescues in conjunction with dewatering efforts.**

DWR shall submit a dewatering and fish rescue plan to NMFS and CDFW for approval prior to construction. After earthen dams are installed, and in conjunction with dewatering, a fish rescue shall be conducted by NMFS- and CDFW-approved fish biologists. As the work site is being dewatered, all fish shall be captured and immediately released to a suitable downstream habitat near the project site. NMFS and CDFW shall be contacted in the event sensitive fish species are encountered during the dewatering effort. Dewatering pumps shall be screened according to NMFS fish-screening criteria for anadromous salmonids (National Marine Fisheries Service 1997).

Habitat Modification

Construction site dewatering would result in the temporary loss of access to ~~designated critical aquatic habitat and EFH~~ while the project is being constructed. Ultimately, the project would result in better habitat connectivity and movement for fish species. Therefore, this impact would be less than significant.

Construction of the proposed project would result in the permanent loss of approximately 2.06 acres of suitable aquatic habitat for fish species. Permanent impacts on aquatic habitat, potentially including impacts to EFH and designated critical habitat, would result from the construction of the fish passage structure, placement of engineered streambed material in project channels, the culvert crossing at Agricultural Crossing 2, and placement of engineered streambed material. However, the impact of this loss would be minimal compared to the long-term benefits of the project, which include improved fish passage through enhancement of migration corridors. A Biological Assessment has been prepared to address potential impacts to EFH and designated critical habitat, and ESA and Magnuson-Stevens Fishery Conservation and Management Act consultation will occur with NMFS.

Some of this aquatic habitat that would be permanently lost consists of shaded riverine aquatic habitat; although the project design allows some riparian trees to be avoided, construction would result in the permanent loss of a minimal amount of shaded riverine aquatic habitat.

Although this impact is expected to have minimal effects on the overall quality of habitat within the project area, these losses are considered a significant impact on special-status fish species because they constitute a permanent effect on ~~natural substrate~~ shaded riverine aquatic habitat. Implementation of the compensatory measure included in Mitigation Measure ~~FISH-3~~ WILD-22 for loss of riparian habitat, which may contain shaded riverine aquatic habitat (refer to the “Loss of Nesting and Foraging Habitat” impact discussion in the Wildlife Resources section)., would reduce this impact to less than significant.

Operational Effects

Following completion of construction, operation of the fish passage structure would coincide with Fremont Weir overtopping events and anadromous adult fishes (e.g., Chinook salmon, Central Valley steelhead, green and white sturgeon, and Pacific lamprey) and other migratory fishes (e.g., Sacramento splittail and river lamprey) are expected to benefit as a direct result of proposed project implementation. Improved connectivity with the Sacramento River would yield increased opportunities for upmigrating fishes in the Yolo Bypass to successfully re-enter the mainstem river.

Following an overtopping event, project flows through the fish passage structure would be limited to approximately 1,100 cfs or less. Because of the small percentage of Sacramento River flow diverted directly through the structure, it is unlikely that fish in the Sacramento River would be adversely affected. Hydraulic modeling simulations indicate that the additional flow through the proposed fish passage structure onto the Yolo Bypass would not significantly decrease water surface elevations or flow in the downstream Sacramento River (see Figures 3.15-1 through 3.15-8 in section 3.15, “Utilities and Service Systems”).

As floodwaters recede and connectivity with the Sacramento River is lost, fish downstream of the fish passage structure would either move downstream and exit the Yolo Bypass volitionally, move downstream and access the Wallace Weir Fish Collection Facility, remain in the Tule Pond until the next high-flow event, or become stranded in isolated ponds in the FWWA and require rescue. Improved fish passage through the modified agricultural road crossings would provide fish enhanced opportunities to exit the Yolo Bypass from the south or via the Wallace Weir facility. Fish that remain in the Tule Pond have a less certain fate because a subsequent high-flow event is not guaranteed to occur. Those fish may ultimately perish as water quality and prey availability begin to diminish, though stranding in the Tule Pond is likely to be reduced as a result of the proposed project.

Operation of the fish passage structure may have the unintended consequence of increasing stranding of adult and juvenile fish in the structure or in one or more of its associated channels, which would be potentially significant. Implementation of the post-construction monitoring included in Mitigation Measure FISH-43 would reduce this impact to less than significant (refer to Appendix B for a description of the Post-Construction Monitoring Evaluation and Adaptive Management Plan). Annual maintenance activities at the fish passage structure and associated channels (e.g., debris removal and occasional sediment removal), consistent with current practices, would occur out of water during the dry season and thus would have no effect on special-status fish species. Regular, in-water maintenance at the agricultural road crossings, consistent with current practices, would also occur during the low-flow summer months. These activities may result in temporary, localized increases in sound and turbidity, but would be similar to existing maintenance activities and would not result in significant effects on special-status fish species. Special-status fish species are not likely to be present during the low-flow season and any fish that may be present can easily vacate the area, if disturbed.

**~~Mitigation Measure FISH-3: Compensate for Loss of Essential Fish~~**

~~The permanent loss of EFH shall be compensated for by purchasing mitigation credits from an approved mitigation bank. Mitigation ratios shall be determined in coordination with NMFS and USACE during the permitting process.~~

**Mitigation Measure FISH-43: Modified structures shall be monitored for stranded special-status fish after construction following an overtopping event.**

Following an overtopping event, an NMFS- and CDFW-approved fish biologist shall survey the fish passage structure, the Upstream Channel (which connects the fish passage structure to the Sacramento River), and Reach 1 (which connects the fish passage structure to the downstream deep pond). Adult fish shall be captured and relocated to the Sacramento River, and any potential stranding trouble spots shall be noted. Additional earthwork shall be performed at these sites in the event that post-construction monitoring (refer to Appendix B, “Post-Construction Monitoring, Evaluation, and Adaptive Management Plan”) indicates that stranding has increased as a direct result of project implementation. A technical

memorandum will be submitted to NMFS, USFWS, and CDFW annually for a duration of five years after the fish passage structure becomes operational. This memorandum will include a summary of stranding sites and a discussion of adaptive management decisions and maintenance activities performed.

### Night Lighting

Adult and juvenile salmonids and sturgeon are active in low light conditions. While the effects of artificial light on Chinook salmon and sturgeon have not been heavily studied, the effects of artificial lighting on sockeye salmon have been studied in both field and laboratory trials. Juvenile sockeye salmon have been observed avoiding an otherwise suitable migration corridor or foraging area in the presence of artificial light during non-daylight hours (McDonald 1960; Tabor et al. 2004), and may experience increased mortality due to predation (Ginetz and Larkin 1976; Tabor et al. 2004). Exposure to artificial lighting during non-daylight hours may have a similar effect on juvenile Chinook salmon, and may cause adult salmonids and sturgeon to display avoidance behavior. If proposed construction activities require the use of night lighting near ESA-listed fish habitat when ESA-listed species are expected to be present, the impact on these species would be potentially significant. Implementation of the protective measures for work during non-daylight hours included in Mitigation Measure FISH-4 would reduce this potential impact to less than significant levels.

### **Mitigation Measure FISH-4: Implement protective measures for work during non-daylight hours near ESA-listed fish habitat.**

If project activities must occur during non-daylight hours, a qualified biologist shall establish monitoring measures, including frequency and duration, based on species presence, individual behavior, and type of construction activities. When night work cannot be avoided, night lighting shall be used only within the portion of the project actively being worked on, and focused directly on the work area. Lights on work areas shall be shielded and focused to minimize lighting of ESA-listed fish species habitat, if ESA-listed fish species are expected to be present. If the work area is located near surface waters, the lighting shall be shielded such that it does not shine directly into the water. If ESA-listed fish species are showing signs of distress or are attracted to the lighted areas, work activities shall be modified to prevent ESA-listed fish species from altering their migration or feeding behavior. At any time, the biologist shall have the authority to halt work if there are any signs of distress or disturbance that may lead to delayed migrations or increased predation. Work shall not resume until corrective measures have been taken or it is determined that continued activity would not adversely affect ESA-listed fish species.

*b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?*

**Less than Significant with Mitigation Incorporated.** Construction at the new channel, fish ladder, deep pond, and the agricultural road crossings would result in the permanent loss of approximately 3.01 acres of riparian vegetation (Table 3.5-5). Acreage of permanent loss includes approximately 0.67 acre within the proposed footprint of the agricultural road crossings, and approximately 2.34 acres within the proposed construction areas for the channels and deep pond. To minimize impacts, the channel alignments and construction disturbance areas were designed to avoid large trees or groups of trees, where feasible.

Riparian habitat is designated as a sensitive natural community because of its declining trend and high value to wildlife and hydrologic function. Loss of shaded riverine aquatic habitat provided by riparian

vegetation within the project area would reduce habitat quality by eliminating cover and food. Because riparian habitat is considered a sensitive natural community, the loss of approximately 3.01 acres of riparian habitat would be significant. Implementation of the habitat compensation measures included in Mitigation Measure WILD-19 would reduce this impact to less than significant.

*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?*

**Less than Significant with Mitigation Incorporated.** Construction of the proposed project would result in the permanent loss of approximately 0.13 acre of wetlands and approximately 0.33 acre of other waters of the United States within the Tule Canal and the deep pond (Table 3.5-6). Because the affected bank and channel bed in the project area is native soil, construction of Agricultural Road Crossing 2 and installation of the engineered streambed material would be considered fill in a non-wetland water of the United States. Construction would be regulated under Section 404 of the CWA and would require a permit, most likely an Individual Permit, from USACE. Construction would also require Section 401 water quality certification from the Central Valley Regional Water Quality Control Board, and CDFW may impose additional requirements as part of the streambed alteration agreement under Section 1602 of the CFGC. With implementation of Mitigation Measures WILD-2, WQ-2, WQ-3, and WET-1, the potential impact would be reduced to less than significant.

**Table 3.5-6 Impacts on Wetlands and Other Waters of the United States in the Proposed Project Area**

	Fremont Weir	Mt. Meixner Spoil Area	Elkhorn Spoil Area	Ag Road Crossing 2	Ag Road Crossing 3	Total
<b>Permanent Impacts</b>						
Wetlands						
Agricultural wetland	—	—	—	—	—	—
Excavated swale	0.06	—	—	—	—	0.06
Forested wetland	—	—	—	0.05	—	0.05
Ruderal wetland	—	—	—	—	—	—
Scrub-shrub	—	—	—	0.02	—	0.02
Other waters						
Canal	—	—	—	0.10	—	0.10



	Fremont Weir	Mt. Meixner Spoil Area	Elkhorn Spoil Area	Ag Road Crossing 2	Ag Road Crossing 3	Total
Riverine	0.23	—	—	—	—	0.23
Scour channel	—	—	—	—	—	—
Total Permanent	<del>0.28</del> 0.29	—	—	0.17	—	0.46
<b>Temporary Impacts</b>						
Wetlands						
Agricultural wetland	—	—	—	—	—	—
Excavated swale	<del>0.01</del> —	—	—	—	—	<del>0.01</del> —
Forested wetland	—	—	—	0.22	—	0.22
Ruderal wetland	—	—	—	—	—	—
Scrub-shrub	—	—	—	0.02	—	0.02
Other waters						
Canal	—	—	—	0.32	0.43	<del>0.7</del> 0.75
Riverine	0.72	—	—	—	—	0.72
Scour channel	—	—	—	—	—	—
Total Temporary	<del>40.73</del> 0.72	—	—	0.56	0.43	<del>4.72</del> 1.71

**Mitigation Measure WET-1: Compensate for the loss of federally protected wetlands.**

Construction and placement of project features shall be limited to the smallest area necessary to meet the project purpose. Final determination of jurisdictional status and associated project impacts on such jurisdictional wetlands and waters shall be decided by USACE. If as a result of a wetland delineation and jurisdictional determination, the USACE determines that the proposed Project would impact jurisdictional

waters and wetlands, avoidance, minimization, and mitigation measures, such as the purchase of mitigation bank credits at an accredited bank, shall be implemented pursuant to USACE guidance to ensure that the project would result in no-net-loss of waters of the U.S.

*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 sites?*

**Less than Significant with Mitigation Incorporated.** Installation of coffer dams and channel dewatering during construction could temporarily disrupt western pond turtle and giant garter snake movement through aquatic habitat, but these construction activities would not substantially interfere with the movement of these species because both species could move through adjacent upland habitat. Raptors and songbirds are known to nest within and adjacent to the project area. Construction activities could interfere with nesting activities, as construction activities and vegetation removal would occur during the breeding season. In addition, noise from construction activities could temporarily alter foraging patterns of resident wildlife species in the project area. Although construction is only expected to last one season, this interference with wildlife movement or nesting behavior would result in a potentially significant impact. Implementation of the general wildlife protection measures, avoidance and minimization measures, pre-construction surveys, construction buffers, and biological monitoring measures included in Mitigation Measures WILD-1 through WILD-495, WILD-7 through WILD-9, and WILD-11 through WILD-22 would reduce the potential impact to less than significant.

Although fish presence in the project area is mostly associated with high flows in the winter and spring months, some fish species are potentially present year-round. During construction, dewatering activities within the Tule Canal could result in fish strandings, resulting in a potentially significant impact. However, implementation of the avoidance work windows and fish rescue effort included in Mitigation Measures FISH-1, FISH-2, and FISH-43 would reduce the impact to less than significant.

The primary purpose of the proposed project is to provide enhanced fish passage opportunities for salmonids and sturgeon during and immediately following an overtopping event, reduce fish stranding in the Fremont Weir stilling basin, provide an alternate exit pathway to the Tule Pond for fish that are unable to pass Fremont Weir, and improve fish passage at agricultural road crossings. Operation of the proposed project would result in improved fish movement, which would be a beneficial effect. Maintenance activities would be similar to existing conditions and would not adversely affect fish or wildlife movement, resulting in a less-than-significant impact.

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

**No Impact.** Yolo County does not have a tree or other biological resource preservation policy or ordinance. Through compliance with State and federal regulations protecting special-status species and sensitive biological resources, such as wetlands and waters of the United States, the proposed project would not conflict with any policies in the 2030 Countywide General Plan. Because the proposed project would not conflict with any local policies or ordinance, there would be no impact.

*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?*

**No Impact.** The proposed project was designed to minimize permanent adverse effects on riparian habitat and wetlands, and includes mitigation measures to reduce temporary and permanent effects on these habitats and associated special-status species to less-than-significant levels. In addition, the proposed project would improve aquatic habitat and enhance fish passage in the project area. The proposed project would not conflict with any provisions in the draft Yolo HCP/NCCP or Yolo Local Conservation Plan. There would be no impact.

## 3.6 Cultural Resources

ENVIRONMENTAL ISSUES		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less- than- Significant Impact	No Impact
V. Cultural Resources.					
Would the project:					
a.	Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b.	Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c.	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d.	Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### 3.6.1 Affected Environment

The project area is located in the Yolo Bypass, a flood control feature of the Sacramento River Flood Control Project. The Fremont Weir is located at the head of the Yolo Bypass in the Fremont Weir Wildlife Area, a California Department of Fish and Wildlife-managed area used for recreational hunting. Other portions of the bypass are used for farming. The area surrounding the agricultural road crossings is agricultural land that uses water from the Tule Canal. The Tule Canal is in the Yolo Bypass adjacent to the Yolo Bypass east levee (refer to Figure 1-1 in Chapter 1.0, “Introduction”). The term project area is synonymous with project footprint and area of potential effects (APE).

#### 3.6.1.1 Literature Review and Surveys

A literature search for the Fremont Weir Adult Fish Passage Modification Project was conducted by the staff of the Northwest Information Center (NWIC) of the California Historical Resources Information System, California State University, Sonoma, and California State University, Chico, on September 11, 2014, and by the NWIC on April 8, 2015. The searches encompassed a 0.5-mile radius around the APE.

Databases consulted include:

- California Inventory of Historic Resources (California Department of Parks and Recreation 1976).
- Office of Historic Preservation Archaeological Determinations of Eligibility (California Department of Parks and Recreation 2012a).
- Office of Historic Preservation Historic Property Directory, which includes listings of the California Register of Historical Resources (CRHR) (California Department of Parks and Recreation 2012b), California Historical Landmarks (California Department of Parks and Recreation 1996), California Points of Historical Interest (California Department of Parks and

Recreation 1992), and the National Register of Historic Places (NRHP) (United States Department of the Interior 1988).

### **3.6.1.2 Historical Resources/Historic Properties Identified in the APE**

The records search identified two historic-era resources in the APE: the Tule Canal (P-57-000414), and the Tule Canal culvert and control structure (P-57-000416). Two additional structures, Fremont Weir (P-57-001117) and the Yolo Bypass east levee (P-57-001118), were recorded during cultural resource surveys between April 2014 and August 2016.

The Tule Canal and the Tule Canal culvert and control structure were evaluated for historical significance and were determined ineligible for the NRHP and the CRHR. The canal and canal culvert are not considered historical properties under National Historic Preservation Act (NHPA) or historical resources under CEQA.

The Yolo Bypass east levee and the Fremont Weir were evaluated for the NRHP and the CRHR. They both are features of the Sacramento River Flood Control Project (SRFCP). Both were recommended as not individually eligible for the NRHP and the CRHR, but they could potentially be eligible as contributors to a historic SRFCP district. For the purposes of this project, they are considered historic properties under NHPA and historical resources under CEQA.

### **3.6.1.3 Archaeological Resources/Historic Properties Identified in the APE**

No archaeological resources were identified in the APE from either the record search or the pedestrian survey; however, archaeological sites are present in the project vicinity, in close proximity to the Sacramento River. The archaeological site CA-YOL-41/H is NRHP eligible and is close to one of the potential staging areas, but is not in the area of direct impacts. The Upstream Channel and Reach 1 were thought to have a high potential for buried archaeological sites because of their close proximity to the river. The agricultural road crossings were determined to have a much lower sensitivity because they are farther away from the Sacramento River and other natural water courses, and are areas with substantial historic ground disturbance.

Because the Upstream Channel and Reach 1 were thought to have a high potential for subsurface archaeological sites, geoarchaeological testing (trenching) was done within the proposed channel alignment between the weir and the river to test for the presence of archaeological resources and to characterize the sensitivity of the area for buried archaeological sites. The geoarchaeological testing was done July 14–15, 2016, by Far Western Anthropological Research Group, Inc. (Scher 2016). Wendy Pierce and Monica Nolte of DWR and Mr. Laverne Bill of the Yocha Dehe Wintun Nation monitored the work. The stratigraphic sequence, differing in the thickness of the layers, was consistent in the five trenches. There is a recent cap of silt at the top, up to 3 feet thick. Below that the deposits are cumelic, with weak soil development and two separate horizons/layers that represent brief surfaces. The most distinct of these surfaces was the lowest/deepest one. No buried archaeological resources were found during the geoarchaeological testing.

#### **3.6.1.4 Native American Consultation**

The Native American Heritage Commission (NAHC) was asked to conduct a sacred lands file search for the APE. The NAHC completed the search, and on July 25, 2016, responded that no sacred lands are recorded in the APE.

On June 2, 2016, Reclamation sent consultation letters to four Native American tribes: the Wilton Rancheria, the United Auburn Community of the Auburn Rancheria of California (UAIC), the Yocha Dehe Wintun Nation, and the Ione Band of Miwok Indians of California, pursuant to Section 106 of NHPA, notifying them of the proposed project and formally inviting them to consult. On July 26, Reclamation also sent a consultation letter to the Cortina Band of Indians. No responses to those letters were received.

For a discussion of Native American consultation in compliance with Assembly Bill 52, pursuant to Public Resources Code (PRC) Section 210803.1, see section 3.14, “Tribal Cultural Resources.”

#### **3.6.1.5 Paleontological Resources**

The APE is located in Holocene-age sediments, which formed after the end of the last glacial maximum (Gutierrez 2011). Holocene sediments are recent, less than 11,000 years old, and are not considered to contain paleontological resources. Project activities would not extend beyond the Holocene geologic units and into older sediments. For that reason, there is no possibility of the presence of paleontological resources.

### **3.6.2 Regulatory Setting**

Multiple State and federal laws govern the treatment of cultural resources. Both CEQA and PRC Section 5024 apply to State-owned resources and State-sponsored projects. Because DWR is partnering with Reclamation and the proposed project includes actions that involve issuance of United States Army Corps of Engineers 404 and 408 permits, there is a federal nexus and compliance with the NHPA and its implementing regulations (36 Code of Federal Regulations [CFR] 800, 36 CFR 60, and 36 CFR 63) is required.

#### **3.6.2.1 Federal**

##### *National Environmental Policy Act of 1969*

NEPA, as amended (United States Code, Title 42, Sections 4321–4347), obligates federal agencies to consider the environmental consequences and costs of their projects and programs as part of the planning process. According to the NEPA regulations, in considering whether an action may “significantly affect the quality of the human environment,” an agency must consider, among other things, unique characteristics of the geographic area, such as proximity to historic or cultural resources (CFR, Title 40, Section 1508.27[b][3]) and the degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the NRHP (40 CFR 1508.27[b][8]). NEPA establishes the federal policy of “preserving important historic, cultural, and natural aspects of our national heritage” during federal project planning. All federal or federally assisted projects requiring action pursuant to Section 102 of the act must take into account the effects on cultural resources.

*National Historic Preservation Act Section 106 and Guidelines*

The NHPA of 1966, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for listing in the NRHP. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the council (36 CFR 800).

The guidelines, 36 CFR Section 800.8(a)(1), also encourage integrating the NHPA and NEPA: “Federal agencies are encouraged to coordinate compliance with Section 106 with any steps taken to meet the requirements of NEPA. Agencies should consider their Section 106 responsibilities as early as possible in the NEPA process, and plan their public participation, analysis, and review in such a way that they can meet the purposes and requirements of both statutes in a timely and efficient manner.”

Under Section 106, cultural resource significance is evaluated in terms of eligibility for listing in the NRHP. The NRHP criteria for evaluation are defined at 36 CFR 60.4 as follows:

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association, and that:

- A. are associated with events that have made a contribution to the broad pattern of our history;
- B. are associated with the lives of people significant in our past;
- C. embody the distinct characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or,
- D. have yielded, or are likely to yield, information important in prehistory or history (36 CFR 60.4).

If historic properties are identified in the project area, effects of the proposed project on those properties must be assessed. If effects will be adverse, the federal agency will continue working with the consulting parties to resolve the adverse effects through project modifications, avoidance, minimization, or mitigation (36 CFR Sections 800.5–800.6).

*Post-Review Discovery 36 CFR 800.13 (b)(3)*

As a subpart of the Section 106 process, 36 CFR 800.13 states the following related to post-review discoveries:

- (b) Discoveries without prior planning. If historic properties are discovered or unanticipated effects on historic properties found after the agency official has completed the Section 106 process without establishing a process under paragraph (a) of this section, the agency official shall make reasonable efforts to avoid, minimize or mitigate adverse effects to such properties and:



(3) If the agency official has approved the undertaking and construction has commenced, determine actions that the agency official can take to resolve adverse effects, and notify the SHPO/Tribal Historic Preservation Officer (THPO), any Indian tribe or Native Hawaiian organization that might attach religious and cultural significance to the affected property, and the Advisory Council on Historic Preservation (ACHP) within 48 hours of the discovery. The notification shall describe the agency official's assessment of National Register eligibility of the property and proposed actions to resolve the adverse effects. The SHPO/THPO, the Indian tribe or Native Hawaiian organization, and the ACHP shall respond within 48 hours of the notification. The agency official shall take into account their recommendations regarding National Register eligibility and proposed actions, and then carry out appropriate actions. The agency official shall provide the SHPO/THPO, the Indian tribe or Native Hawaiian organization, and the ACHP a report of the actions when they are completed.

#### 3.6.2.2 State

##### *California Environmental Quality Act — Statute and Guidelines*

CEQA requires that public agencies that finance or approve public or private projects must assess the effects of the project on cultural resources (CEQA Guidelines Section 15064.5). “Cultural resource” is a general term that encompasses CEQA’s definition of historical resources (PRC Section 21084.1), unique archaeological resources (PRC Section 21083.2), tribal cultural resources (PRC Section 21074), and paleontological resources (CEQA Guidelines Appendix G). CEQA requires that alternative plans or mitigation measures must be considered if a project would result in significant effects on important cultural resources. Only historical resources (PRC Section 21084.1) and tribal cultural resources (PRC Section 21083.4.3) need to be addressed. Therefore, prior to the development of mitigation measures, the significance of cultural resources with the potential to be affected by the project must be determined. The criteria for determining historical significance are defined in PRC Section 5024.1.

##### *California Public Resources Code Section 5024*

PRC Section 5024.1 establishes the CRHR, which is the authoritative guide for identifying the state’s historical resources to indicate what properties are to be protected, if feasible, from substantial adverse change.

For a resource to be eligible for the CRHR, it must be more than 50 years old, retain its historic integrity, and satisfy all of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.
2. Is associated with the lives of persons important in our past.
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. Has yielded, or may be likely to yield, information important in prehistory or history.

##### *Procedure for Discovery of Archaeological Resources during Construction*

CEQA Guidelines also require that a lead agency make provisions for the accidental discovery of historical or archaeological resources. Pursuant to Section 15064.5(f), these provisions should include “an immediate evaluation of the find by a qualified archaeologist. If the find is determined to be an historical or unique archaeological resource, contingency funding and a time allotment sufficient to allow for implementation of avoidance measures or appropriate mitigation should be available. Work could

continue on other parts of the building site while historical or unique archaeological resource mitigation takes place.”

*Discoveries of Human Remains under Health and Safety Code Section 7050.5 (b-c) and California Public Resources Code Section 5097.98 (a).*

In the event of discovering human remains, there shall be no further excavation or disturbance of the remains until they are examined by the Yolo County Coroner. The coroner has two working days to determine the nature of those remains. If the coroner determines that the remains are Native American archaeological remains, he/she shall contact the Native American Heritage Commission (NAHC) by telephone within 24 hours.

Once the NAHC has been notified of the discovery of Native American human remains, it shall immediately notify those persons believed to be the Most Likely Descendants, as defined in PRC Section 5097.98(a). The Most Likely Descendants may inspect the site of the discovery and recommend to the owner methods of treating, with dignity, the human remains and any associated grave goods. The descendants shall complete their inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site.

### 3.6.2.3 Local

There are no local plans, policies, or regulations applicable to the proposed project.

## 3.6.3 Environmental Effects

### 3.6.3.1 No-Action Alternative

No changes to existing conditions would result under the No-Action Alternative. This alternative would have no impacts on historical resources, including undiscovered archaeological resources. The existing structures would continue to be maintained in their current manner. Therefore, the No-Action Alternative would have no impact on historical, archaeological, and paleontological resources.

### 3.6.3.2 Proposed Project Alternative

Proposed operation and maintenance activities would be similar to existing conditions and would not adversely affect cultural resources. Thus, project operation and maintenance are not discussed further for this resource.

*a) Cause a substantial adverse change in the significance of a historical resource?*

**Less than Significant.** The proposed project would entail minor modifications of Fremont Weir. Fremont Weir is not individually eligible for the NRHP or the CRHR, but is being treated as an eligible contributor to the SRFCP historic district. The proposed modifications are minimal and would be less than significant.

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

**Less than Significant with Mitigation Incorporated.** No known prehistoric or historic-era archaeological resources meeting CRHR or NRHP eligibility criteria were previously recorded within the APE, found during archaeological surveys, or found during geoarchaeological testing. Nevertheless,

excavation of channels and earth-working activities during proposed project construction have the potential to affect unrecorded archaeological resources. If archaeological resources are encountered during the construction and post-construction phases, a potentially significant impact would occur. Implementation of the cultural resources awareness training in Mitigation Measure CUL-1, the monitoring measure included in Mitigation Measure CUL-2, and the stop work and treatment measures included in Mitigation Measure CUL-3 would reduce this impact to less than significant.

**Mitigation Measure CUL-1: Conduct cultural resources awareness training.**

The following mitigation measure shall be implemented before the start of ground-disturbing activities.

- DWR staff shall conduct cultural resources awareness training for construction contractors and staff prior to the start of construction and as new personnel arrive on the work site.

**Mitigation Measure CUL-2: Retain Native American monitors before conducting ground-disturbing activities.**

Native American monitors provided by the Yocha Dehe Wintun Nation and the United Auburn Indian Community shall be retained to monitor ground-disturbing activities in the project footprint.

**Mitigation Measure CUL-3: If archaeological resources are discovered, cease construction activities and implement appropriate treatment measures.**

The following mitigation measures shall be implemented before the start of ground-disturbing activities.

- If historical or unique archaeological resources/historic properties are discovered during construction, work must be halted within 100 feet of the find until a qualified archaeologist meeting the Secretary of the Interior's Standards for archaeologists (62 CFR 33708) visits the site and assesses the significance of the resource. The federal agency official must follow 36 CFR 800.13(b)(3) and notify the SHPO, tribes, and ACHP within 48 hours of discovery. Work may continue on other parts of the project while evaluation and, if necessary, mitigation takes place (CEQA Guidelines Section 15064.5 [f]). After the assessment is completed, the archaeologist shall submit a report describing the significance of the discovery with cultural resource management recommendations. If the find is determined to be an historical or unique archaeological resource/historic property, time allotment and funding sufficient to allow for implementation of avoidance measures, or appropriate mitigation, must be available.
- Should significant archaeological resources be found, the resources shall be treated in compliance with PRC Section 21083.2. If the project can be modified to accommodate avoidance, preservation of the site is the preferred alternative. Data recovery of the damaged portion of the site also shall be performed pursuant to PRC Section 21083.2(d).

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

**No Impact.** Geological units bearing paleontological resources are not present in the APE. There would be no impact on paleontological resources.

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

**Less than Significant with Mitigation Incorporated.** No human remains or archaeological contexts have been identified in the APE. Because geoarchaeological testing in the APE did not find archaeological materials, it is unlikely that human remains would be encountered during construction

activities. But, the potential to unearth human remains during construction still exists. Ground-disturbing activities have the potential to result in the discovery of, or inadvertent damage to, human remains, and this possibility cannot be completely eliminated. Consequently, there is a potential for significant impacts. Implementation of monitoring and the stop work and treatment procedures included in Mitigation Measures CUL-2 and CUL-4 would reduce the potential impacts to less than significant.

**Mitigation Measure CUL-4: If human remains are found, cease construction activities and implement appropriate procedures for the treatment of remains.**

If human remains are found, such remains are subject to the provisions of Health and Safety Code Sections 7050.5–7055. The requirements and procedures shall be implemented, including immediately stopping work in the vicinity of the find and notifying the Yolo County Coroner. The process for notification of the California NAHC and consultation with the individual(s) identified by the NAHC as the most likely descendent is set forth in Section 5097.98 of the California PRC. The federal agency official must follow 36 CFR 800.13(b)(3) and notify the SHPO, tribes, and ACHP within 48 hours of discovery. Work can restart after the remains have been investigated and appropriate recommendations have been made for the treatment and disposition of the remains.

## 3.7 Geology and Soils

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VI. Geology and Soils.</b>				
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
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 California Geological Survey Special Publication 42.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial risks to life or property?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### 3.7.1 Affected Environment

#### 3.7.1.1 Geology

The project area is located within the Great Valley geomorphic province of California (California Geological Survey 2002). The project area is underlain by alluvial basin deposits. The California Geological Survey (2011) further describes the alluvial basin deposits as fine-grained sediments of late Holocene age with horizontal stratification deposited by standing or slow-moving water in topographic low-lying areas.

##### *Seismicity*

The earthquake hazard level for the project area is relatively low compared with the rest of California. The project area is distant from known, active faults and experiences seismic shaking less frequently. (California Geological Survey 2008a).

##### *Primary Seismic Hazards*

There are two primary seismic hazards in California: surface fault rupture and seismic ground shaking.

The surface fault rupture risk for the project area is low, as the project area is not located in an Alquist-Priolo Earthquake Fault Zone (California Geological Survey 2015), and active faults have not been identified in the project area (California Geological Survey 2010). The Dunnigan Hills fault, which is located approximately 12 miles west of the project area, is the nearest inactive fault (California Geological Survey 2010). The Hunting Creek fault, located in the far northwestern portion of Yolo County, is the nearest major active fault (California Geological Survey 2010).

##### *Strong Ground Shaking*

Ground shaking is the primary cause of earthquake damage to human-made structures. Ground motion is affected by near-surface soils; deep geologic structures, such as sedimentary basins; and the mechanics of the earthquake itself. Ground shaking usually dissipates as the distance from a fault increases, but softer geological conditions may exacerbate ground shaking at locations distant from the fault.

The ground-shaking hazard in the project site is low, according to an online seismic hazard map that estimates peak horizontal ground-acceleration values (California Geological Survey 2008b).

##### *Liquefaction*

Liquefaction is the sudden temporary loss of strength in saturated, loose- to medium-dense, granular sediments subjected to ground shaking. Liquefaction can cause foundation failure of buildings and other facilities as a result of the reduction of foundation-bearing strength. The water table in the project area is high and the soils are deep. Based on these criteria, the potential for liquefaction is considered moderate; however, the project area has not been comprehensively evaluated to determine its liquefaction hazard, and no site-specific information is available. As indicated previously, the ground-shaking hazard in the project site is low.

##### *Landslides*

A landslide is defined as “the movement of a mass of rock, debris, or earth down a slope” (Cruden 1991). Landslides are a type of “mass wasting,” which denotes any down-slope movement of soil and rock under the direct influence of gravity. The term “landslide” encompasses five modes of slope movement: falls,

topples, slides, spreads, and flows. The potential for landslides is absent given the gently sloping valley topography that occurs throughout the project area.

#### *Land Subsidence*

Land subsidence is a gradual settling or sudden sinking of the earth's surface resulting from subsurface movement of earth materials. Subsidence in Yolo County is attributable to groundwater withdrawal, which has resulted in as much as 4 feet of elevation change in some parts of the county. The East Yolo Groundwater Subbasin has been affected most dramatically, with communities near Zamora, Knights Landing, and Woodland experiencing damage and loss of structural integrity to highways, levees, wells, and irrigation canals (County of Yolo 2009). The land subsidence in the project area is not known, although estimated potential subsidence for the project area is high, according to the DWR Groundwater Information Center Interactive Map (California Department of Water Resources 2016).

#### *Other Hazards*

Volcanic activity, tsunamis, and mudflow are unlikely to affect the project area and are not discussed further in this section.

#### **3.7.1.2 Soils**

The Natural Resources Conservation Service mapped the soils in the project area. The data are available through the University of California, Davis, California Soil Resource Laboratory (California Soil Resource Laboratory 2015).

The soil survey mapped six soil map units within the project area: Water; Sacramento soils, flooded; Sycamore complex, flooded; Sycamore silt loam, flooded; and Tyndall very fine sandy loam, flooded.

The Sacramento soils are deep (i.e., more than 80 inches to a restrictive layer) and poorly drained. The parent material is mixed clayey alluvium. The surface soil profile extends to 16 inches and is comprised of silty clay loam. The two soil profiles below 16 inches extend to 60 inches and are comprised of clay.

The Sycamore complex soils are deep and somewhat poorly drained. The parent material is mixed alluvium derived from sedimentary rock. The top two soil profiles are silty clay loam and extend to 44 inches. The soil profile between 44 and 60 inches is silty clay.

The Sycamore silt loam soils are deep and somewhat poorly drained. The parent material is mixed alluvium derived from sedimentary rock. The top two soil profiles are comprised of silt loam and extend to 60 inches.

The Tyndall very fine sandy loam soils are deep and somewhat poorly drained. The parent material is mixed alluvium derived from sedimentary rock. The top two soil profiles are comprised of very fine sandy loam and extend to 60 inches.

Shrinking and swelling can cause damage to buildings, roads, and other structures and is typical of soils with high clay content. Linear extensibility is a measure used to determine the shrink-swell potential of soils. Linear extensibility of less than 3 percent represents low shrink-swell potential, 3–6 percent is moderate, 6–9 percent is high, and greater than 9 percent is very high. At linear extensibility values greater than 3 percent, shrinking and swelling can cause damage to buildings, roads, and other structures.



Soils in the project area near the Fremont Weir have a linear extensibility of 1.5 percent, so the potential for shrink-swell damage is low. The linear extensibility of soils at the four agricultural road crossings ranges from 4.5 percent to 7.5 percent, indicating a moderate-to-high shrink-swell potential.

### 3.7.2 Regulatory Setting

#### 3.7.2.1 Federal

There are no federal regulations applicable to geology and seismicity in the project area. Section 402 of the Clean Water Act (CWA) pertains to soils.

##### *Clean Water Act Section 402 (National Pollutant Discharge Elimination System Program)*

CWA Section 402 regulates point-source and nonpoint-source discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program. In California, the State Water Resources Control Board (SWRCB) oversees the NPDES program and the regional water quality control boards (RWQCBs) administer it. Construction of the proposed project would require a construction general permit for stormwater discharges and a dewatering permit. Additionally, the applicant may need to file a report of waste discharge to obtain waste discharge requirements (WDRs) from the Central Valley Regional Water Quality Control Board (CVRWQCB) for disposing construction spoils.

#### 3.7.2.2 State

##### *Alquist-Priolo Earthquake Fault Zoning Act*

The Alquist-Priolo Geologic Hazards Zone Act was passed in 1972 by the State of California to mitigate the hazard of surface faulting to structures for human occupancy. The act has been amended 10 times and was renamed the Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) on January 1, 1994. The Alquist-Priolo Act's main purpose is to prevent the construction of structures used for human occupancy on the surface trace of active faults as documented in *Special Publication 42* by the California Geological Survey (CGS). The Alquist-Priolo Act only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards.

##### *Seismic Hazards Mapping Act*

The Seismic Hazards Mapping Act of 1990 was enacted, in part, to address seismic hazards not included in the Alquist-Priolo Act, including strong ground shaking, landslides, and liquefaction. Under this act, the State Geologist is assigned the responsibility of identifying and mapping seismic hazards. CGS *Special Publication 117*, adopted in 1997 by the State Mining and Geology Board, constitutes guidelines for evaluating seismic hazards other than surface faulting, and for recommending mitigation measures as required by Public Resources Code Section 2695(a). In accordance with the mapping criteria, the CGS seismic hazard zone maps use a ground-shaking event that corresponds to 10 percent probability of exceedance in 50 years.

##### *California Building Code*

The California Building Code (CBC) is another name for the body of regulations known as the California Code of Regulations, Title 24, Part 2, which is a portion of the California Building Standards Code (CBSC). The CBSC requires extensive geotechnical analysis and engineering for grading, foundations, retaining walls, and other structures, including criteria for seismic design.

Published by the International Conference of Building Officials, the Uniform Building Code (UBC) is a widely adopted model building code in the United States. The CBC incorporates by reference the UBC with necessary California amendments. About one-third of the text within the CBC has been tailored for California earthquake conditions. The Yolo County General Plan incorporates by reference the most recent version of the UBC and CBC.

#### 3.7.2.3 Local

The Yolo County General Plan outlines the relevant policies pertaining to seismic and geologic hazards (County of Yolo 2009).

- Goal HS-1: Geologic Hazards. Protect the public and reduce damage to property from earthquakes and other geologic hazards.
  - Policy HS-1.3: Require environmental documents prepared in connection with CEQA to address seismic safety issues and to provide adequate mitigation for existing and potential hazards identified.

### 3.7.3 Environmental Effects

#### 3.7.3.1 No-Action Alternative

Under the No-Action Alternative, the existing fish passage structure at Fremont Weir would not be improved and the agricultural road crossings would not be improved or removed. There would be no impact on soils, minerals, or geology.

#### 3.7.3.2 Proposed Project Alternative

*a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:*

1. 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?
2. Strong seismic ground shaking?
3. Seismic-related ground failure, including liquefaction?
4. Landslides?

**Less than Significant with Mitigation Incorporated.** The project area is not within an Alquist-Priolo Fault Zone. There is no evidence of recent faulting within the project area and no active faults are mapped near the project area, so there is no surface rupture hazard within the project area. Additionally, the gently sloping topography of the project area precludes the possibility of landslides occurring within the project area. Therefore, the project would not expose people or structures to rupture of a known earthquake fault or landslides.

The ground-shaking hazard in the project area is low. Potential ground-shaking impacts would be minimized because the project applicant would be required to implement CBC standards into the project design. Structures must be designed to meet the regulations and standards associated with the CBC standards to minimize the potential fault rupture and ground-shaking hazards. Geotechnical drilling (30-percent level of design) has been completed for the fish ladder modification at Fremont Weir, and for the agricultural road crossings. The final geotechnical study required to comply with the CBC standards

would be developed prior to construction activities and the seismic design parameters would be based on the building codes in effect.

The project area has not been comprehensively evaluated to determine its liquefaction hazard, and no site-specific information is available. The depth to the water table in the project area is potentially high because of its proximity to the Sacramento River. Thus, the potential exists that liquefaction at the project site could result in structural damage and an associated life and safety hazard, which would be a significant impact. Implementation of Mitigation Measure GEO-1 would reduce the impact from seismic ground shaking and seismic-related ground failure, including liquefaction, to less than significant.

**Mitigation Measure GEO-1: Incorporate findings from the site-specific geotechnical investigation into project design.**

Design of the fish passage structure and the agricultural road crossing designs shall incorporate California Building Code seismic design criteria and levee design criteria used by the United States Army Corps of Engineers (USACE). DWR's Division of Engineering shall use these parameters in the project evaluation and design, and shall incorporate findings from the site-specific geotechnical investigation conducted for the project as part of the preliminary design through final design.

*b) Result in substantial soil erosion or the loss of topsoil?*

**Less than Significant with Mitigation Incorporated.** Construction of the proposed project would require backfilling, earthmoving, grading, and compaction that would expose areas of soil presently covered with vegetation to wind and water erosion. The extent of erosion that could occur varies depending on soil type, vegetation/cover, weather conditions, and, in the case of local levees, their slope. This is considered a potentially significant impact.

Concentrated water erosion, if not managed or controlled, could eventually result in significant soil loss and/or discharging of sediment into downstream waterways. Implementation of a stormwater pollution and prevention plan and the best management practices included in Mitigation Measure WQ-3 and WQ-4 (refer to section 3.10, "Hydrology and Water Quality"), respectively, would reduce the impact of soil erosion or the loss of topsoil to less than significant.

*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?*

**Less than Significant with Mitigation Incorporated.** There may be some potential for geologic instability and structural damage at the site, with a potential risk to life and safety. Implementation of Mitigation Measure GEO-1, which incorporates USACE seismic design criteria and levee design criteria based on findings from the geotechnical investigation, would ensure that impacts from potential geologic instability hazards would be reduced to less than significant.

*d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial risks to life or property?*

**Less than Significant with Mitigation Incorporated.** The shrink/swell associated with expansive soils has the potential to result in damage to buildings, roads, and other structures, which would be a significant impact. Soils in the project area near the Fremont Weir have a linear extensibility of 1.5

percent, so the potential for shrink-swell damage is low. The linear extensibility of soils at the agricultural road crossings ranges from 4.5 percent to 7.5 percent, indicating a moderate-to-high shrink-swell potential. But the CBC standards include detailed provisions to ensure that foundation design is appropriate to site conditions. Expansive soils would be addressed in a manner consistent with the current engineering standard of care through adherence with the CBC standards.

Implementation of Mitigation Measure GEO-1, where design elements would be incorporated that would take expansive soils into account in project design, would reduce this impact to less than significant.

*e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?*

**No Impact.** The proposed project would not include a septic system. There would be no impact.

### 3.8 Greenhouse Gas Emissions

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. Greenhouse Gas Emissions.				
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

#### 3.8.1 Affected Environment

When sunlight reaches the earth's surface, shortwave energy heats the surface while longer-wave energy (infrared heat) is reradiated to the atmosphere. Greenhouse gases (GHGs) absorb this energy and trap the heat in the lower atmosphere.

Naturally occurring GHGs include water vapor, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O). Synthetic GHGs include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). All of these GHGs, with the exception of water vapor, are targeted for reduction in Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. Nitrogen trifluoride (NF<sub>3</sub>) was not initially listed in AB 32 but was subsequently added to the list via legislation.

While CO<sub>2</sub> occurs naturally in the atmosphere, such human activities as burning coal, oil, gas, and wood move carbon from solid storage to its gaseous state, thereby increasing atmospheric concentrations. Sources of CH<sub>4</sub> are both natural (through biological processes in low-oxygen environments) and artificial (through rice farming, cattle production, natural gas use, and coal mining). Sources of N<sub>2</sub>O include agricultural and industrial processes, as well as vehicle emissions. HFCs and PFCs are synthesized compounds used as refrigerants or in manufacturing. SF<sub>6</sub> is a synthetic gas used in the electricity and magnesium industries. NF<sub>3</sub> is a chemical used in the manufacture of electronics.

The current global concentration of GHGs in the atmosphere is at unprecedented levels when compared with the past 800,000 years. Concentrations of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O have increased greatly since 1750 (40 percent, 150 percent, and 20 percent, respectively) (Intergovernmental Panel on Climate Change 2014). The long-lived GHGs (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, CFCs, HFCs, and SF<sub>4</sub>) are considered to be the largest and most important anthropogenic driver of climate change (Kadir et al. 2013). Among long-lived GHGs, CO<sub>2</sub> is responsible for 64 percent of *radiative forcing*, which refers to a change in the earth's radiative

balance resulting from an imbalance between incoming solar radiation energy and outgoing thermal infrared emission energy. CH<sub>4</sub> contributes approximately 18 percent of total radiative forcing (Kadir et al. 2013; World Meteorological Organization 2012). To analyze the warming potential of GHGs, GHG emissions are typically quantified and reported as CO<sub>2</sub> equivalents (CO<sub>2</sub>e).

Climate change refers to changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system over a long period of time. In California, observations of climate change include an increase in average annual air temperatures, a change in the trend toward more rain than snow, a change in runoff timing, an increase in extreme heat events, a decrease in winter chill times, a rise in sea level, and warmer conditions at higher elevations (Kadir et al. 2013; California Department of Water Resources 2015). Changes in climatic and environmental conditions can also strongly affect terrestrial, marine, and freshwater biological systems. Climate risk in the Sacramento River Hydrologic Region, within which the project area is located, includes stress on ecosystems and species resulting from increased temperatures, reduced reliability of water supplies caused by decreased snowpack storage, greater flood risks, and decreased water quality (California Department of Water Resources 2015).

#### 3.8.1.1 GHG Emissions Analysis

In May, 2012, DWR adopted the *Climate Action Plan Phase 1: Greenhouse Gas Emissions Reduction Plan* (GGERP), which details DWR's efforts to reduce its GHG emissions consistent with Executive Order (EO) S-3-05 and AB 32. DWR also adopted the initial study/negative declaration (IS/ND) prepared for the GGERP in accordance with the CEQA Guidelines review and public process. Both the GGERP and IS/ND are incorporated herein by reference (California Department of Water Resources 2012a; California Department of Water Resources 2012b). The GGERP provides estimates of historical (back to 1990), current, and future GHG emissions related to operations, construction, maintenance, and business practices (e.g., building-related energy use). The GGERP specifies aggressive 2020 and 2050 emission reduction goals and identifies a list of GHG emissions reduction measures to achieve those goals.

DWR specifically prepared its GGERP as a "Plan for the Reduction of Greenhouse Gas Emissions" for purposes of CEQA Guidelines Section 15183.5. Section 15183.5 provides that such a document, which must meet certain specified requirements, "may be used in the cumulative impacts analysis of later projects." Because global climate change, by its very nature, is a global cumulative impact, an individual project's compliance with a qualifying GHG reduction plan may suffice to mitigate the project's incremental contribution to that cumulative impact, to a level that is not "cumulatively considerable" (see CEQA Guidelines, Section 15064, Subdivision [h][3]).

Section 15064 further states that "[l]ater project-specific environmental documents may tier from and/or incorporate by reference" the "programmatic review" conducted for the GHG emissions reduction plan. "An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project" (CEQA Guidelines Section 15183.5, Subdivision [b][2]).

Section 12 of the GGERP outlines five steps that each DWR project must take to demonstrate consistency with the GGERP.

1. Analysis of GHG emissions from construction of the proposed project.
2. Determination that the construction emissions from the project do not exceed the levels of construction emissions analyzed in the GGERP.
3. Incorporation of DWR's project-level GHG emissions-reduction strategies into the design of the project.
4. Determination that the project does not conflict with DWR's ability to implement any of the "Specific-Action" GHG emissions-reduction measures identified in the GGERP.
5. Determination that the project would not add electricity demands to the State Water Project system that could alter DWR's emissions-reduction trajectory in such a way as to impede its ability to meet its emissions reduction goals.

Consistent with these requirements, Appendix E, "Inventory and Calculation of Greenhouse Gas Emissions," demonstrates that the proposed project would meet each of the required elements and would be consistent with the GGERP.

### 3.8.2 Regulatory Framework

Key policies, guidance, executive orders, regulations, and legislation regarding GHGs and climate change are summarized below. For additional information on air quality regulations, refer to section 3.4, "Air Quality."

#### 3.8.2.1 Federal

##### *Federal Clean Air Act*

At the federal level, the United States Environmental Protection Agency (EPA) administers the Clean Air Act (CAA). In 2007, the United States Supreme Court ruled that GHGs are "pollutants" under the CAA. In 2009, the EPA found, under Section 202(a) of the CAA, that six GHGs constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to climate change. These findings serve as a prerequisite to any CAA regulations of GHG emissions from vehicles.

##### *Climate Action Plan and Executive Order 13653*

President Obama's 2013 Climate Action Plan and EO 13653 directs the federal government to strengthen its programs and operations and help communities nationwide prepare for climate change.

##### *National Environmental Policy Act*

In 2016, the White House Council on Environmental Quality released final guidance to assist federal agencies with their analysis of effects of GHG emissions and climate change in NEPA reviews of proposed actions. The guidance does not establish any particular quantity of GHG emissions as "significantly" affecting the quality of the human environment or give greater consideration to the effects of GHG emissions and climate change over other effects on the human environment. The guidance is meant to facilitate compliance with the existing legal requirements of NEPA.

#### 3.8.2.2 State

California's approach to addressing GHG emissions and climate change involves the passage of several pieces of legislation.

#### *Executive Order S-3-05*

EO S-3-05 included the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050 reduce GHG emissions to 80 percent below 1990 levels. The executive order directs the Secretary of the California Environmental Protection Agency to develop and lead a climate action team of State agency representatives and report on the progress made toward meeting the targets to the Governor and the Legislature.

#### *Assembly Bill 32*

AB 32 requires that GHG emissions in California be reduced to 1990 levels by 2020. To comply with AB 32, the California Air Resources Board prepared the AB 32 Scoping Plan, which lays out a GHG-reduction emission framework and identifies measures to meet the GHG emissions target. In May 2014, the *First Update to the Climate Change Scoping Plan* was released.

#### *Senate Bill 97*

In 2007, Senate Bill 97 required the Office of Planning and Research to develop amendments to the CEQA Guidelines that address the analysis and mitigation of GHG emissions. The California Natural Resources Agency (CNRA) adopted the amendments to the CEQA Guidelines in 2010. Key points are summarized as follows:

- Lead agencies must analyze the GHG emissions of proposed projects and reach a conclusion regarding the significance of those emissions (see CEQA Guidelines Section 15064.4).
- When a project's GHG emissions may be significant, lead agencies must consider a range of potential mitigation measures to reduce those emissions (see CEQA Guidelines Section 15126.4[c]).
- Lead agencies may significantly streamline the analysis of GHGs on a project level by using a programmatic GHG emissions-reduction plan that meets certain criteria (see CEQA Guidelines Section 15183.5[b]) (Office of Planning and Research 2016).

#### *California Climate Adaptation Strategy*

The CNRA updated its 2009 *California Climate Adaptation Strategy* with *Safeguarding California: Reducing Climate Risk* in 2014. These policy guidance documents describe advances in climate science, climate risks, work done to date, and recommendations to manage climate risk.

#### *Executive Order B-30-15*

Per EO B-30-15, additional goals were set for the reduction of GHG emissions in California. By 2030, State agencies are further committed to reduce GHG emissions by 40 percent below 1990 levels and by 2050, reduce GHG emissions by 80 percent below 1990 levels.

### **3.8.2.3 Local**

#### *Yolo-Solano Air Quality Management District Regulations*

The project area is located within Yolo County and is regulated by the Yolo-Solano Air Quality Management District (YSAQMD). As discussed in section 3.4, "Air Quality," the YSAQMD has established thresholds for criteria pollutants. Although the YSAQMD has not formally adopted GHG emission thresholds, it is recommended that a qualitative discussion of GHGs be included as part of a CEQA analysis for sizable projects (Ehrhardt et al. 2007).



### *Yolo County Greenhouse Gas Emission Reduction Actions*

Yolo County has undertaken several actions to reduce GHG emissions generated by the county's programs and operations, including implementation of a GHG-emission reporting system, conducting research, encouraging electric vehicle use, and setting a target to reduce GHG emissions from county operations by 80 percent by 2050 (County of Yolo 2016).

### *Yolo County General Plan*

The Conservation and Open Space Element of the *County of Yolo 2030 Countywide General Plan* (County of Yolo 2009) includes strategies to address climate change and reduce GHG emissions. Policies and actions are listed under Goal CO-8: Climate Change. In 2011, Yolo County adopted the *Climate Action Plan: A Strategy for Smart Growth Implementation, Greenhouse Gas Reduction, and Adaptation to Global Climate Change* (CAP) (County of Yolo 2011). The CAP sets the following targets to reduce GHG emissions: 613,651 metric tons of CO<sub>2</sub>e (mtCO<sub>2</sub>e) per year by 2020; 447,965 mtCO<sub>2</sub>e per year by 2030; and 122,730 mtCO<sub>2</sub>e per year by 2050. Adoption of the CAP includes an amendment to General Plan Action CO-A118, which outlines procedures for demonstrating project-level CEQA compliance.

### 3.8.3 Environmental Effects

As described in section 3.4, "Air Quality," short-term project-related construction activities would generate air pollutants, including GHGs, from the operation of construction equipment and vehicles. Construction is anticipated to be completed within one year. Proposed activities include site preparation (vegetation removal, land clearing), earthwork (excavation, fill, grading), installation of concrete and structural improvements, and road realignment. Workers would commute to the project area in passenger vehicles, and construction materials and equipment would be transported to and from the project area by haul trucks. As identified in Appendix E, construction equipment would include excavators, cranes, graders, rollers, bulldozers, tractors, trucks, compressors, and generators. Emissions from construction equipment, as well as estimates of the energy that would be used during the construction period, are summarized in Appendix E. It is estimated that the total construction activity emissions would be approximately 601.8 mtCO<sub>2</sub>e. This quantity would be well below the threshold of an "extraordinary" construction project, which is defined as a project that produces 25,000 mtCO<sub>2</sub>e or more during the entire construction phase, or 12,500 mtCO<sub>2</sub>e during any single year of construction.

#### 3.8.3.1 No-Action Alternative

Under the No-Action Alternative, no modifications to the Fremont Weir or the agricultural road crossings would be made, and there would not be an increase in emissions associated with construction activities. There would be no impact.

#### 3.8.3.2 Proposed Project Alternative

*a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*

**Less than significant.** Based on the analysis provided in the GGERP and the demonstration that the proposed project is consistent with the Inventory and Calculation of Greenhouse Gas Emissions (Appendix E), DWR, as lead agency, has determined that the proposed project's incremental contribution to the cumulative impact of increasing atmospheric levels of GHGs would be less than cumulatively considerable and, therefore, less than significant. DWR would further reduce the proposed project's incremental contribution to the cumulative impact of increasing atmospheric levels of GHGs by

implementing DWR's project-level GHG emissions-reduction best management practices (BMPs) for construction activities. Implementation of these BMPs would reduce GHG emissions from construction projects by minimizing fuel usage by construction equipment, reducing fuel consumption for transportation of construction materials, reducing the amount of landfill material, and reducing emissions from the production of cement.

#### **Pre-Construction and Final Design BMPs**

Pre-construction and Final Design BMPs are designed to ensure that individual projects are evaluated and their unique characteristics taken into consideration when determining if specific equipment, procedures, or material requirements are feasible and efficacious for reducing GHG emissions from the project. While all projects will be evaluated to determine if these BMPs are applicable, not all BMPs would be appropriate for the proposed project.

- **GHG 1.** Evaluate project characteristics, including location, project work flow, site conditions, and equipment performance requirements, to determine whether specifications of the use of equipment with repowered engines, electric drive trains, or other high-efficiency technologies are appropriate and feasible for the project or specific elements of the project.
- **GHG 2.** Evaluate the feasibility and efficacy of performing on-site material hauling with trucks equipped with on-road engines.
- **GHG 3.** Ensure that all feasible avenues have been explored for providing an electrical service drop to the construction site for temporary construction power. When generators must be used, use alternative fuels, such as propane or solar, to power generators to the maximum extent feasible.
- **GHG 4.** Evaluate the feasibility and efficacy of producing concrete on-site and specify that batch plants be set up on-site or as close to the site as possible.
- **GHG 5.** Evaluate the performance requirements for concrete used on the project and specify concrete mix designs that minimize GHG emissions from cement production and curing while preserving all required performance characteristics.
- **GHG 6.** Limit deliveries of materials and equipment to the site to off-peak traffic congestion hours. Construction BMPs apply to all construction and maintenance projects that DWR completes or for which DWR issues contracts. All projects are expected to implement all construction BMPs unless a variance is granted by the Division of Engineering Chief, Division of Operation and Maintenance Chief, or Division of Flood Management Chief (as applicable) and the variance is approved by the DWR CEQA Climate 18 Change Committee. Variances will be granted when specific project conditions or characteristics make implementation of the BMP infeasible and where omitting the BMP will not be detrimental to the project's consistency with the GGERP.

### Construction BMPs

Construction BMPs apply to all construction and maintenance projects that DWR completes or for which DWR issues contracts. All projects are expected to implement all Construction BMPs unless a variance is granted by the Division of Engineering Chief, Division of Operation and Maintenance Chief, or Division of Flood Management Chief (as applicable) and the variance is approved by the DWR CEQA Climate 18 Change Committee. Variances will be granted when specific project conditions or characteristics make implementation of the BMP infeasible and where omitting the BMP will not be detrimental to the project's consistency with the GGERP.

- **GHG 7.** Minimize idling time by requiring that equipment be shut down after five minutes when not in use (as required by California Code of Regulations, Title 13, Section 2485, the State's airborne toxics control measure). Provide clear signage that posts this requirement for workers at the entrances to the site and provide a plan for the enforcement of this requirement.
- **GHG 8.** Maintain all construction equipment in proper working condition and perform all preventative maintenance. Required maintenance includes compliance with all manufacturer's recommendations, proper upkeep and replacement of filters and mufflers, and maintenance of all engine and emissions systems in proper operating condition. Maintenance schedules shall be detailed in an air quality control plan prior to commencement of construction.
- **GHG 9.** Implement a tire inflation program on the job site to ensure that equipment tires are correctly inflated. Check tire inflation when equipment arrives on-site and every two weeks for equipment that remains on-site. Check vehicles used for hauling materials off-site weekly for correct tire inflation. Procedures for the tire inflation program shall be documented in an air quality management plan prior to commencement of construction.
- **GHG 10.** Develop a project-specific ride share program to encourage carpools, shuttle vans, transit passes, and/or secure bicycle parking for construction worker commutes.
- **GHG 11.** Reduce electricity use in temporary construction offices by using high-efficiency lighting and requiring that heating and cooling units be Energy Star compliant. Require that all contractors develop and implement procedures for turning off computers, lights, air conditioners, heaters, and other equipment each day at close of business.
- **GHG 12.** For deliveries to project sites where the haul distance exceeds 100 miles and a heavy-duty class 7 or class 8 semi-truck or 53-foot or longer box-type trailer is used for hauling, a SmartWay2 certified truck will be used to the maximum extent feasible.
- **GHG 13.** Minimize the amount of cement in concrete by specifying higher levels of cementitious material alternatives, larger aggregate, longer final set times, or lower maximum strength, where appropriate.
- **GHG 14.** Develop a project-specific construction debris recycling and diversion program to achieve a documented 50-percent diversion of construction waste.
- **GHG 15.** Evaluate the feasibility of restricting all material hauling on public roadways to off-peak traffic congestion hours. During construction scheduling and execution, minimize, to the extent possible, uses of public roadways that would increase traffic congestion.

*b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?*

**No impact.** DWR's GGERP is in compliance with all applicable plans and policies. The proposed project is consistent with the GGERP. There would be no impact.

### 3.9 Hazards and Hazardous Materials

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

- |   |                          |                          |                                     |                                     |
|---|--------------------------|--------------------------|-------------------------------------|-------------------------------------|
| g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
- 

### 3.9.1 Affected Environment

The project area consists of the Fremont Weir, the Fremont Weir Wildlife Area (FWWA), Agricultural Road Crossings 2 and 3, and the Elkhorn Area (an area within the northern Elkhorn Basin). All project components are located within the northern portion of the Yolo Bypass. Land use in the project area is designated Agriculture by the County of Yolo and is located in a flood inundation zone (County of Yolo 2009).

The California Department of Forestry and Fire Protection (CAL FIRE) has developed a ratings scale for determining the potential for wildland fires. This scale takes into account the type and amount of vegetation (fuel); climate conditions, such as temperature, wind, and humidity; and degree of slope and geographic conditions (topography). The project area is not in a location designated as a Very High Fire Severity Zone (County of Yolo 2009).

The lands immediately surrounding the project area are agricultural lands. Knights Landing is the nearest town/city and is located approximately 5 miles to the northwest of the project area. The city of Woodland is located approximately 7 miles to the southwest of the project area. The closest public airport/airstrip is the Sacramento International Airport, approximately 5 miles to the southeast of Agricultural Road Crossings 2 and 3.

The project area is not in an area that would be listed as a hazardous materials cleanup site, pursuant to Government Code Section 65962.5(a)(4) (California Department of Toxic Substances Control 2016a).

Pursuant to Government Code Section 65962.5, the State Water Resources Control Board (SWRCB) GeoTracker (State Water Resources Control Board 2016) and the California Department of Toxic Substances Control (DTSC) EnviroStor (California Department of Toxic Substances Control 2016b) online databases were consulted on April 13, 2016, to determine if there are any recorded sites of concern within or near the project area. No sites of potential concern were identified in either GeoTracker or EnviroStor within the 3-mile search radius.

### 3.9.2 Regulatory Setting

California Health and Safety Code (HSC), Chapter 6.95, Division 20, Section 25501(n)(1), defines hazardous material.

“Hazardous material” means a material listed in paragraph (2) that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment, or a material specified in an ordinance adopted pursuant to paragraph (3).

Additionally, 42 United States Code Section 6903(5)(a)(b) provides this definition.

The term “hazardous waste” means a solid waste or combination of solid wastes which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may (a) cause, or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness; or (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

### **3.9.2.1 Federal**

The primary federal agency responsible for the regulation of hazardous materials is the Environmental Protection Agency (EPA). The EPA regulates the use of hazardous materials under the authority of the Resources Conservation and Recovery Act (RCRA), and regulates hazardous substances sites under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

#### *Resource Conservation and Recovery Act*

The RCRA (42 United States Code Section 9601 et seq.; 40 Code of Federal Regulations [CFR]) establishes the EPA as the authority to control hazardous waste from the “cradle to grave.” This includes the generation, transportation, treatment, storage, and disposal of hazardous waste.

#### *Comprehensive Environmental Response, Compensation, and Liability Act*

The CERCLA (42 United States Code Chapter 103, Subchapter I et seq. / 29; 40 CFR) authorizes the EPA to establish prohibitions and requirements concerning closed and abandoned hazardous waste sites, provide for liability of persons responsible for releases of hazardous waste at these sites, and establish a trust fund to provide for cleanup when no responsible party could be identified.

#### *RCRA Grant Work Plan*

The RCRA Grant Work Plan authorizes DTSC to clean up contaminated sites and hazardous substances releases that do not qualify for cleanup under the federal CERCLA.

### **3.9.2.2 State**

State agencies have been delegated through legislation to accept federal responsibility for hazardous materials management in California. The California Environmental Protection Agency (CalEPA) and the California Governor’s Office of Emergency Services (Cal OES) establish rules for regulating the use, storage, transport, and disposal of hazardous substances in California. Under Title 13 of the California Code of Regulations (CCR), the California Highway Patrol regulates transport of hazardous materials. The SWRCB is responsible for the protection of California’s water quality and supply. DTSC is tasked

with restoring contaminated resources, enforcing hazardous waste laws, reducing hazardous waste generation, and encouraging the manufacture of chemically safer consumer products.

#### *Accidental Release Prevention Law*

The Accidental Release Prevention Law (HSC Sections 25531–25543.3; CCR Title 19 Division 2, Chapter 45, Section 2735.1) is implemented by Cal OES and is intended to prevent the accidental release of substances that can cause serious harm to the public and the environment, to minimize the damage if such a release were to occur, and to satisfy community right-to-know laws.

#### *California Code of Regulations Title 13 and Title 17*

CCR Title 13 Division 3 and Title 17 provide the California Air Resources Board (CARB) the authority to monitor and regulate California’s 35 local air districts. The CARB promulgates rules and regulations pertaining to California’s Air Quality and Emissions Program.

#### *Underground Storage of Hazardous Materials*

HSC Sections 25280–25299.7 and CCR Title 23 allow the SWRCB to promulgate rules and regulations to protect the public interest and to establish continuing programs to prevent contamination from improper storage of hazardous substances stored underground and provide requirements for the design, construction, and monitoring of hazardous substances in underground storage containers.

#### *Aboveground Petroleum Storage Act*

The Aboveground Petroleum Storage Act (HSC Sections 25270–25270.13) gives the CAL FIRE’s Office of the State Fire Marshall oversight responsibility of this law. The Office of the State Fire Marshall regulates aboveground storage containers or tanks with petroleum storage capacities of 55 gallons or more.

#### *Porter Cologne Water Quality Control Act*

The Porter Cologne Water Quality Control Act (California Water Code Sections 13000–14076; CCR Title 23) establishes the SWRCB and nine regional water quality control boards, and gives these agencies the responsibility for controlling water quality in California. The Porter Cologne Water Quality Control Act also creates a State water-quality policy and enforceable standards for water quality, and regulates the discharge of point-source and non-point-source pollutants. SWRCB is additionally authorized to establish water quality guidelines for long-range resources planning of groundwater and surface water management and the use of recycled water.

#### *Hazardous Materials Handling and Emergency Response*

HSC Sections 240450–2404.9 and CCR Title 27 authorize CalEPA to oversee the Unified Program as a whole and to certify 83 local government agencies known as certified unified program agencies (CUPAs). CUPAs implement the hazardous waste and materials standards set forth in the laws and regulations stated previously. This program ensures consistency throughout the state regarding administrative requirements, permits, inspections, and enforcement of storage and handling of hazardous materials and waste.

#### *Immediate Reporting of a Release or Threatened Release*

CCR Title 19, Division 2, Chapter 4, Section 2631, outlines guidelines for reporting any release or threatened release of a hazardous material.

### 3.9.2.3 Local

In conjunction with State and federal agencies, the Yolo County Environmental Health Division is the CUPA responsible for overseeing the regulatory programs pertaining to hazardous materials in Yolo County. Under the authority of the HSC, the CUPA oversees such programs as the Aboveground Storage Tank Program, California Accidental Release Prevention Program, Hazardous Waste Generators Program, Underground Storage Tank Program, Hazardous Materials Business Plan Program, Onsite Hazardous Waste Program, and Hazardous Materials Emergency Response.

#### *Hazardous Materials Handling and Emergency Response*

HSC Section 25501 authorizes CUPAs and program agencies throughout the state to consolidate the administration, permitting, inspection, and enforcement activities related to hazardous materials and waste of the Unified Program set forth by CalEPA.

### 3.9.3 Environmental Effects

#### 3.9.3.1 No-Action Alternative

Under the No-Action Alternative, there would be no construction activities in the project area and thus none involving hazardous materials or waste. There would be no impact.

#### 3.9.3.2 Proposed Project Alternative

- a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? — and —*
- b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment?*

**Less than Significant with Mitigation Incorporated.** Proposed construction and maintenance activities would involve the routine use, handling, and transport of hazardous substances, such as diesel fuels, gasoline, hydraulic fluids, and lubricants. The routine use, handling, storage, and transport of those hazardous materials constitute an inherent risk that could result in the exposure of workers to hazardous materials and, if those hazardous materials were accidentally released, become a hazard to the environment. This would result in a potentially significant impact. Nonetheless, all hazardous materials would be used, stored, and transported according to standard procedures and protocols. In addition, implementation of the hazardous materials management plan; the spill prevention, control, and countermeasure plan; and the stormwater pollution and prevention plan included in Mitigation Measures WQ-1, WQ-2, and WQ-3 (refer to section 3.10, “Hydrology and Water Quality”) would reduce the potential impact to less than significant.

- c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*

**No Impact.** There are no schools within 0.25 mile of the project area. The closest school is the Science and Technology Academy at Knights Landing for grades K-8, which is approximately 4.5 miles to the northwest of the project area. Additionally, the construction and maintenance activities for the proposed project would not emit any hazardous emissions or require handling of any acutely hazardous materials or substances. Therefore, there would be no impact.



*d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?*

**No Impact.** Government Code Section 65962.5(a)(1) states that DTSC shall compile and update annually all hazardous waste facilities subject to corrective action. In accordance with this code, there are no listed hazardous materials sites in the EnviroStor database within the project area or within a 3-mile radius of the project area. The proposed project would not be located on a hazardous materials site. Therefore, there would be no impact.

*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? — and —*

*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?*

**No Impact.** There are no residences within the project area. The proposed project is not located within an airport land-use plan, within 2 miles of a public-use airport, or in the vicinity of a private airstrip. The nearest public airport or public-use airport is the Sacramento International Airport, which is located approximately 3.5 miles to the southeast of Agricultural Road Crossings 2 and 3. The nearest private airstrips are Vestal Airstrip, which is approximately 3.4 miles to the northeast of the project area, and Sopwith Farms Airstrip, which is approximately 3.5 miles to the east of the project area. The proposed project would not result in an airport-related safety hazard for people working in the project area. Therefore, there would be no impact.

*g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*

**No Impact.** According to the *Yolo County Multi-Jurisdictional Hazard Mitigation Plan* (Yolo County 2012), the project is not located within any major thoroughfares that may be used as an evacuation route or muster locations, nor does it contain any essential facilities for emergency response. The project is located within a flood inundation zone and the proposed project would not impede the function of this zone. Therefore, there would be no impact.

*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?*

**Less than Significant.** The project area is not located in an area designated by CAL FIRE as a Moderate Fire Severity Zone, High Fire Hazard Severity Zone, or Very High Fire Hazard Severity Zone (Yolo County 2012). The project is located in an area with no population center or standing structures; therefore, the project is not likely to expose people or structures to significant loss, injury, or death caused by wildland fires. Fire risk associated with construction of the proposed project would be less than significant.

## 3.10 Hydrology and Water Quality

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>IX. Hydrology and Water Quality.</b>				
Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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 on- or off-site erosion or siltation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) 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 which would result in on- or off-site flooding?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) Result in inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### 3.10.1 Affected Environment

#### 3.10.1.1 Hydrology

##### *Regional Setting*

The proposed project is within the Sacramento River Hydrologic Region. The Sacramento River Hydrologic Region encompasses an area of approximately 17.4 million acres (27,200 square miles) and contains all, or large portions, of Modoc, Siskiyou, Lassen, Shasta, Tehama, Glenn, Plumas, Butte, Colusa, Sutter, Yuba, Sierra, Nevada, Placer, Sacramento, El Dorado, Yolo, Solano, Lake, and Napa counties (California Department of Water Resources 2003a). Most of Northern California is located in the Sacramento River Hydrologic Region, which encompasses several watersheds of various sizes.

According to the United States Geological Survey (USGS), the project area is within the Sacramento-Stone Corral watershed (USGS Hydrologic Unit Code #18020104) (United States Geological Survey 1978).

##### *Local Setting*

Fremont Weir, constructed by the United States Army Corps of Engineers (USACE) in 1924, is located about 15 miles northwest of Sacramento and 8 miles northeast of Woodland. It is the first overflow structure on the Sacramento River's west bank, located between River Miles 81.7 and 83.4. It marks the beginning of the Yolo Bypass. Fremont Weir is a 9,120-foot-long fixed-concrete weir, with an earthfill section dividing it into two parts. The crest of the concrete weir section is at an elevation of 33.5 feet (United States Engineering Datum), and the crown of the earthfill section is at an elevation of 47.0 feet (United States Engineering Datum) (California Department of Water Resources 2016).

#### *Surface Water Hydrology*

Fremont Weir's primary purpose is to release overflow waters of the Sacramento River, the Sutter Bypass, and the Feather River into the Yolo Bypass. The release reduces Sacramento River levels and minimizes flooding of nearby cities and other areas. The project design capacity of the weir is 343,000 cubic feet per second (cfs) (California Department of Water Resources 2010a). The Yolo Bypass conveys 80 percent of the system's floodwaters southward to its confluence with the lower Sacramento River near Rio Vista. The weir begins to overtop when combined upstream flows exceed approximately 55,000 cfs (California Department of Water Resources 2015a and 2015b), which is attained when the Sacramento River stage exceeds a range of 32.1-foot to 32.9-foot elevation (cbec et al. 2014).

During the 44-year period from 1968 to 2011, Fremont Weir overtopped during 29 years (66 percent), according to the updated hydrology dataset (California Department of Water Resources 2015c). The study *Agricultural and Economic Impacts of Yolo Bypass Fish Habitat Proposals* (Howitt et al. 2013) evaluated a shorter time frame of 26 years (1984–2009) because of concern about the accuracy of the data from 1968 to 1983. The Fremont Weir overtopped during 15 of those 26 years (58 percent). Not all overtopping events result in complete inundation of the Yolo Bypass (cbec et al. 2014).

#### *Groundwater Hydrology*

DWR delineates groundwater basins throughout California under the State's Groundwater Bulletin 118. The proposed project is located in the Sacramento Valley Groundwater Basin, Colusa Subbasin (Basin No. 5-021.52). The Colusa Subbasin has a surface area of 918,380 acres (1,434 square miles). It is bounded on the east by the Sacramento River, on the west by the Coast Ranges and foothills, on the north by Stony Creek, and on the south by Cache Creek.

Groundwater-level data show an average seasonal fluctuation of approximately 5 feet for normal and dry years. There does not appear to be any increasing or decreasing trend in groundwater levels in the Colusa Subbasin. Based on available information, DWR calculated groundwater storage capacity in the Colusa Subbasin at 13,025,887 acre-feet to a depth of 200 feet (California Department of Water Resources 2003b).

#### *Flood Management*

The Yolo Bypass is a central feature of the Sacramento River Flood Control Project (SRFCP), which conveys floodwaters from the major valley rivers, including the Sacramento, American, and Feather rivers, and their tributary watersheds. The primary function of the Yolo Bypass is flood protection. The Yolo Bypass conveys as much as 80 percent of the flow of the Sacramento River basin during high-water events (Sommer et al. 2001) to help control river stage and protect the cities of Sacramento, West Sacramento, Davis, and other local communities, farms, and lands from flooding (California Department of Fish and Game 2008).

The east and west banks of the Yolo Bypass are SRFCP levees. All other banks are existing raised earthen areas that also serve as agricultural roads and are locally maintained. The proposed project is considered to be within a 100-year floodplain (Zone AE), as designated by the Federal Emergency Management Agency (FEMA) (Federal Emergency Management Agency 2012).

### Surface Water Quality

The fourth edition of *The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region* (Basin Plan) (Central Valley Regional Water Quality Control Board 2011), which pertains to the Sacramento River and San Joaquin River basins, describes beneficial uses for the Yolo Bypass (Table 3.10-1). Section 303(d) of the federal Clean Water Act (CWA) established the total maximum daily load (TMDL) process to assist in guiding the application of State water quality standards. Section 303(d) requires states to identify streams in which water quality is impaired (i.e., affected by the presence of pollutants or contaminants) and to establish the TMDL, which is the maximum quantity of a particular contaminant that a waterbody can assimilate without experiencing adverse effects. Table 3.10-2 shows CWA 303(d) listed impairments for the Tule Canal and the Sacramento River in the vicinity of the project area, based on the *2010 California Integrated Report* (California State Water Resources Control Board 2011).

**Table 3.10-1 Designated Beneficial Uses for Surface Water Bodies in the Project Vicinity**

Waterbody	Designated Beneficial Uses
Sacramento River (from Colusa Basin Drain to I Street Bridge)	Municipal and domestic water supply; irrigation; contact, canoeing and rafting, and other noncontact recreation; warm and cold freshwater habitat; warm and cold fish migration; warm and cold fish spawning; wildlife habitat, and navigation.
Yolo Bypass	Irrigation; stock watering; water contact and noncontact recreation; warm freshwater habitat; cold freshwater habitat <sup>a</sup> ; warm and cold fish migration; warm fish spawning; wildlife habitat.

Source: Central Valley Regional Water Quality Control Board 2011 (Table II-1)

Note:

<sup>a</sup> Potential beneficial use.

**Table 3.10-2 CWA 303(d) Listed Impaired Waters with Potential to be Affected by the Proposed Project**

Waterbody	Pollutant Stressors	Potential Sources	TMDL Completion Date
Sacramento River (from Knights Landing to the Delta)	Chlordane	Agriculture	Est. 2021
	DDT (Dichlorodiphenyltrichloroethane)	Agriculture	Est. 2021
	Dieldrin	Agriculture	Est. 2022
	Mercury	Resource Extraction (abandoned mines)	Est. 2012
	PCBs (Polychlorinated biphenyls)	Unknown	Est. 2021
	Unknown Toxicity	Unknown	Est. 2019
Tule Canal	Boron	Unknown	Est. 2021
	<i>Escherichia coli</i> ( <i>E. coli</i> )	Unknown	Est. 2021
	Fecal Coliform	Unknown	Est. 2021
	Salinity	Unknown	Est. 2021

Source: State Water Resources Control Board 2011

Notes: Delta = Sacramento-San Joaquin Delta, Est.= estimated, TMDL = total maximum daily load

The reach of the Sacramento River from Knights Landing to the Delta is listed as an impaired waterbody owing to the presence and concentration of chlordane, dichlorodiphenyltrichloroethane (DDT), dieldrin, mercury, and polychlorinated biphenals (PCBs). Chlordane, DDT, and dieldrin are persistent sediment-bound contaminants that have accumulated over time from past use of these organochlorine pesticides. These pesticides tend to accumulate at the top of aquatic food webs and reach higher concentrations with increasing trophic levels. Although the use of most organochlorine pesticides was banned decades ago, the pesticides persist in concentrations that correspond to land use and past application rates (United States Geological Survey 1999). Mercury is also a persistent sediment-bound contaminant. Mercury sources in the Sacramento River include abandoned gold mine tailings in the Central Valley watershed. The most toxic form of mercury is methylmercury because of chemical properties that allow the organometallic to be accumulated and magnified in fish and wildlife. Through the activities of sulfate reducing bacteria, methylmercury is produced in surficial sediments. Enhanced methylmercury production has been documented in newly flooded fields or fields that have been rewetted (Heim et al. 2010). PCBs are a type of chlorinated hydrocarbon that was manufactured from 1929 to 1979. PCBs, which were used in hundreds of industrial and commercial applications, do not readily break down once in the environment and can accumulate in the above-ground part of plants and food crops, as well as in the bodies of small organisms and fish (United States Environmental Protection Agency 2016).

The Tule Canal is listed as an impaired waterbody owing to the presence and level of boron, *Escherichia coli* (*E. coli*), fecal coliforms, and salinity. Boron is an inorganic compound used in the production of many products, including pesticides. Boron enters the environment mainly through the weathering of rocks and to a lesser extent from anthropogenic sources (United States Environmental Protection Agency 2008). Fecal coliforms are a type of bacteria that exist in the digestive tract and feces of animals, including humans. *E. coli* is a species of fecal coliform bacteria that is considered to be the best indicator of fecal pollution (New York State Department of Health 2004). The Tule Canal discharges to the Toe Drain. The Toe Drain is tidally influenced, with water levels controlled by operation of Lisbon Weir. At times during summer months, a net upstream flow occurs in the toe drain, which may contribute to salinity in the Tule Canal.

#### *Groundwater Water Quality*

Groundwater quality in the subbasin is characterized as a calcium magnesium or magnesium bicarbonate type (California Department of Water Resources 2003b). Total dissolved solids (TDS) values range from 120 to 1,220 milligrams per liter (mg/L), averaging 391 mg/L. Local (i.e., in the vicinity of Knights Landing) impairments include high TDS, boron, and nitrates (California Department of Water Resources 2003b).

### 3.10.2 Regulatory Setting

#### **3.10.2.1 Federal**

The following federal regulations may apply to the implementation of the proposed project.

#### *Clean Water Act, Section 404*

Section 404 of the CWA regulates the discharge of dredged or fill material into “waters of the United States,” which include oceans, bays, rivers, streams, lakes, ponds, and wetlands. Project proponents must obtain a permit from USACE for all discharges of dredged or fill material into waters of the United States before proceeding with a proposed activity. Before any actions that may affect surface waters are

implemented, a delineation of jurisdictional waters of the United States must be completed, following USACE protocols, to determine whether the project area contains wetlands or other waters of the United States that qualify for CWA protection.

#### *Clean Water Act, Section 401*

Under federal CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. All projects that have a federal component and may affect the state's water quality (including projects that require federal agency approval, such as issuance of a Section 404 permit) also must comply with CWA Section 401. In California, the authority to grant water quality certification has been delegated to the State Water Resources Control Board (SWRCB), and applications for water quality certification under CWA Section 401 typically are processed by the regional water quality control boards (RWQCBs) with local jurisdiction. Water quality certification requires evaluation of potential impacts with regard to water quality standards and CWA Section 404 criteria governing discharge of dredged and fill materials into waters of the United States.

#### *Clean Water Act, Section 303(d) and Total Maximum Daily Loads*

In California, the SWRCB develops the list of water-quality-limited segments; the United States Environmental Protection Agency approves each state's list. Waters on the list do not meet water quality standards even after required pollution control technology is installed at point sources of pollution. Section 303(d) also establishes the TMDL process to improve water quality in listed waterways.

#### *Rivers and Harbors Appropriation Act of 1899, Section 10*

Section 10 of the River and Harbors Appropriation Act of 1899 (River and Harbors Act) requires that the construction of weirs, dams, dikes, and other structures in navigable waters of the United States, must be approved and permitted by USACE. Construction includes any dredging, filing, excavation, or disturbance of sediment that may affect the course, location, or condition of the waterbody.

#### *Rivers and Harbors Appropriation Act of 1899, Section 14*

Section 14 of the River and Harbors Act (33 United States Code 408) provides that the Secretary of the Army may grant permission for the occupation or use of an existing project built by the USACE. Alterations to certain public works, including federal flood control levees, must not impair the usefulness of the work or be injurious to the public. Section 408 alterations include actions that could change the hydraulic capacity of the floodway or change the existing configuration of the federal flood-control project.

#### *National Flood Insurance Act and Flood Disaster Protection Act*

The National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 were intended to reduce the need for large, publicly funded flood-risk management structures and disaster relief by restricting development on floodplains. FEMA administers the National Flood Insurance Program (NFIP) to subsidize flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA issues flood insurance rate maps for communities participating in the NFIP. The maps delineate flood hazard zones in the community. The maps are designed for flood insurance purposes only and do not necessarily show all areas subject to flooding. The maps designate lands likely to be inundated

during a 100-year storm event and elevations of the base flood. They also depict areas between the limits affected by 100-year and 500-year events and areas of minimal flooding. The maps often are used to establish building pad elevations to protect new development from flooding effects.

#### **Requirements for Federal Emergency Management Agency Certification**

For guidance on floodplain management and floodplain hazard identification, communities turn to FEMA guidelines, as defined in 44 Code of Federal Regulations (CFR) 59 through 77. For a levee to be recognized by FEMA under the NFIP, the community must provide evidence demonstrating that adequate design, operation, and maintenance systems are in place to provide reasonable assurance that protection from the base flood (1 percent, or 100-year flood) exists. These specific requirements are outlined in 44 CFR 65.10, “Mapping of Areas Protected by Levee Systems.”

#### ***United States Army Corps of Engineers Levee Design Criteria***

All levees included in the proposed project area are federally authorized and fall within the jurisdiction of USACE. The levee evaluation for the proposed project area conforms to the engineering criteria established by USACE for the assessment and repair of levees.

#### ***Executive Order 11988 Floodplain Management***

Executive Order (EO) 11988, established in 1977, addresses floodplain issues related to public safety, conservation, and economics. The order generally requires that federal agencies constructing, permitting, or funding actions meet the following requirements:

- Avoid incompatible floodplain development.
- Be consistent with the standards and criteria of the NFIP.
- Restore and preserve natural and beneficial floodplain values.

In January 2015, EO 13690, “Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input,” which amended portions of EO 11988, was signed. In October 2015, guidelines were established to provide broad guidance to federal agencies on the implementation of EOs 11988 and 13690.

#### **3.10.2.2 State**

The following State regulations related to hydrology and water quality may apply to implementation of the proposed project.

#### ***Porter-Cologne Water Quality Control Act of 1969***

The Porter-Cologne Water Quality Control Act established the SWRCB and nine RWQCBs as the primary State agencies with regulatory authority over appropriative surface water rights allocations and California water quality. Under this act (and the CWA), the State is required to adopt a water quality control policy and waste discharge requirements to be implemented by the SWRCB and nine RWQCBs. The SWRCB also establishes water quality control plans (basin plans) and statewide plans. The RWQCBs carry out SWRCB policies and procedures throughout the state. Basin plans designate beneficial uses for specific surface water and groundwater resources and establish water quality objectives to protect those uses.



### *Central Valley Regional Water Quality Control Board Basin Plan*

The Central Valley Regional Water Quality Control Board (CVRWQCB) is responsible for implementing its basin plan for the Sacramento River and its tributaries. The basin plan identifies beneficial uses of the river and its tributaries and water quality objectives to protect those uses. Numerical and narrative criteria are contained in the basin plan for several key water-quality constituents, including dissolved oxygen, water temperature, trace metals, turbidity, suspended material, pesticides, salinity, radioactivity, and other related constituents (Central Valley Regional Water Quality Control Board 2011).

### *California Fish and Game Code, Section 1602 Streambed Alteration Agreement*

Under Chapter 6 of the California Fish and Game Code (CFGF), the California Department of Fish and Wildlife (CDFW) is responsible for the protection and conservation of the state's fish and wildlife resources. Section 1602 et seq. of the code defines the responsibilities of CDFW and requires that public and private applicants obtain an agreement to "divert, obstruct, or change the natural flow or bed, channel, or bank of any river, stream, or lake designated by CDFW in which there is at any time an existing fish or wildlife resource or from which those resources derive benefit, or will use material from the streambeds designated by the department." A lake or streambed alteration agreement is required under Section 1602 of the CFGF for all activities that involve temporary or permanent activities within State jurisdictional waters.

### *Central Valley Flood Protection Plan*

According to California Government Code Sections 65302.9 and 65860.1, every city and county located within the Sacramento and San Joaquin valleys is required to amend its general plan and zoning ordinance in a manner consistent with the Central Valley Flood Protection Plan (CVFPP) within 24 months of July 2, 2013, after DWR develops and releases 100-year and 200-year floodplain maps. The CVFPP contains a plan for sustainable flood management and improved flood-risk management through the use of the *State Plan of Flood Control* facilities. The CVFPP is scheduled to be updated in 2017. In addition, the locations of the State and local flood-management facilities, locations of flood hazard zones, and the properties located in these areas must be mapped and consistent with the CVFPP.

### *Central Valley Flood Protection Board*

The Central Valley Flood Protection Board (CVFPB) (formerly the California Reclamation Board) regulates the modification and construction of levees and floodways in the Central Valley defined as part of the Sacramento Valley and San Joaquin Valley flood control projects. Rules promulgated in Title 23 of the California Code of Regulations (CCR) (Title 23, Division 1, Article 8 [Sections 111–137]) regulate the modification and construction of levees to ensure public safety. The rules state that existing levees may not be excavated, or left partially excavated, during the flood season, which is November 1 through April 15 for the Sacramento River and Sacramento Bypass.

Title 23, CCR Sections 6 and 7 stipulate permitting authority to the CVFPB. Section 6(a) outlines the need to obtain a permit from the CVFPB for "Every proposal or plan of work, including the placement, construction, reconstruction, removal, or abandonment of any landscaping, culvert, bridge, conduct fence, projection, fill, embankment, building...that involves cutting into the levee wholly or in part within any area for which there is an adopted plan of flood control, must be approved by the board prior to the commencement of work." Section 7(a) requires that "Prior to submitting an encroachment permit application to the board, the application must be endorsed by the agency responsible for maintenance of levees within the area of the proposed work...."

The following CVFPB guidance has been followed during the levee evaluation:

The California Reclamation Board has primary jurisdiction approval of levee design and construction. The Reclamation Board standards are found in Title 23, Division 1, Article 8 (Sections 111 through 137) of the CCR, and constitute the primary state standard. Section 120 of the CCR directs that levee design and construction be in accordance with the USACE's Engineer Manual EM 1110-2-1913, Design and Construction of Levees. This document is the primary federal standard applicable to this project, as supplemented by additional prescriptive standards contained in Section 120 of the CCR. These additional standards prescribe minimum levee cross-sectional dimensions, construction material types, and compaction levels.

### 3.10.2.3 Local

#### *Yolo County General Plan*

The Conservation and Open Space Element and the Health and Safety Element of the *2030 Countywide General Plan* (County of Yolo 2009) contain goals and policies related to water quality and flooding. The following goals and policies from the general plan may apply to the proposed project.

#### **Conservation and Open Space Element**

**Goal CO-5: Water Resources.** Ensure an abundant, safe, and sustainable water supply to support the needs of existing and future generations.

- **Policy CO-5.6.** Improve and protect water quality for municipal, agricultural, and environmental uses.
- **Policy CO-5.13.** Ensure that regional, State, and federal water projects protect local water rights and areas of origin.
- **Policy CO-5.17.** Require new development to be designed such that nitrates, lawn chemicals, oil, and other pollutants of concern do not impair groundwater quality.
- **Policy CO-5.23.** Support efforts to meet applicable water quality standards for all surface and groundwater resources.

#### **Health and Safety Element**

**Goal HS-2: Flood Hazards.** Protect the public and reduce damage to property from flood hazards.

- **Policy HS-2.2:** Ensure and enhance the maintenance and integrity of flood control levees.
- **Policy HS-2.3:** Actively update and maintain policies and programs to ensure consistency with state and Federal requirements.

#### *Yolo County Floodplain Development Permit*

To satisfy the requirements of the Yolo County Floodplain Management Ordinance, projects planned for construction within a special flood hazard area (SFHA) (100-year floodplain) must meet development and construction standards specifically designed to prevent or limit flood damage.

Application submittals for subdivisions, development plans, land use permits, and other entitlement changes within a floodplain must include the flood zone designation, base flood elevations, and ground

elevations on the maps or plans submitted. The building inspection division will check the maps or plans for certification of flood zone and elevation by a registered civil engineer or land surveyor.

The planning division will review building permit applications. If a property is determined to be in a SFHA, the applicant will be required to obtain a floodplain permit from the building inspection division before a building permit can be issued.

### 3.10.3 Environmental Effects

#### 3.10.3.1 No-Action Alternative

Under the No-Action Alternative, no construction activities would occur to enhance fish passage at the Fremont Weir fish ladder, in Tule Canal, and in the channels upstream and downstream of the fish ladder. There would be no impacts on existing hydrology and water quality. Beneficial impacts on fish passage from modified flows through the Fremont Weir fish ladder, channels, and agricultural road crossings would not occur.

#### 3.10.3.2 Proposed Project Alternative

- a) *Violate any water quality standards or waste discharge requirements? — and —*  
 f) *Otherwise substantially degrade water quality?*

**Less than Significant with Mitigation Incorporated.** Modification of the existing weir structure, agricultural road crossings, and channels, construction of the equipment platform, and equipment staging during project construction would result in moderate ground disturbance (approximately 7.5 acres) in the project area. Heavy machinery would be used within the construction areas, which could result in the contamination of riverbank and bed soils resulting from spills of petroleum products and other pollutants during vehicle operation, refueling, parking, and annual maintenance. Improper handling, storage, or disposal of these materials in the vicinity of the project area could cause degradation of surface water quality if they are eventually washed into the Tule Canal or the Sacramento River. Furthermore, placement of engineered streambed material at the modified portions of the channel and agricultural road crossings would stir up sediment and contribute to downstream sedimentation, resulting in increased turbidity. Placement of soil on Mt. Meixner could also result in increased sediment loading downstream during periods that Fremont Weir overtops. But, most of the construction work and ongoing maintenance activities associated with the proposed project would occur on the dry, downstream side of the Fremont Weir and the agricultural road crossings. Dewatering would occur upstream of the weir and agricultural road crossings during construction. Even with these precautions, it would still be possible for soil or contaminants to be washed downstream during construction, which would result in a potentially significant impact. Implementation of the hazardous materials management plan, spill prevention and control plan, stormwater pollution prevention plan, construction best management practices (BMPs), and turbidity monitoring plan included in Mitigation Measures WQ-1 through WQ-4, respectively, would ensure that all water quality risks would be minimized and the impact would be reduced to less than significant.

During operation of the proposed project, hydraulic modeling simulations indicate that the additional flow from the Sacramento River through the proposed fish passage structure onto the Yolo Bypass would not significantly decrease water surface elevations or flow in the downstream Sacramento River (refer to Figures 3.15-1 through 3.15-8 in section 3.15, “Utilities and Service Systems” and Appendix F, “Flow

Analysis”). Thus, water quality impacts on the Sacramento River downstream of Fremont Weir would be less than significant.

Methylmercury is a water quality concern within the Yolo Bypass (California Department of Fish and Game 2008). But, total mercury levels in sediment in the proposed project area are among the lowest concentrations in the Yolo Bypass. Total mercury levels in sediments in the vicinity of Fremont Weir are less than 0.10 micrograms per gram (Heim et al. 2010; California Department of Water Resources 2015d). Furthermore, hydraulic modeling results indicate that the Yolo Bypass inundation footprint, frequency, and duration are not expected to increase with implementation of the proposed project (Appendix G). Therefore, the proposed project’s impact on methylmercury production would be less than significant.

Similarly, based on modeling results and timing of operation, implementation of the proposed project is not expected to affect other contaminant levels within the Tule Canal and would result in a less than significant impact.

**Mitigation Measure WQ-1: Implement a hazardous materials management plan.**

Prior to the start of any construction activities, a hazardous materials management plan (HMMP) shall be developed and implemented to ensure that all staff transport, store, handle, notify, and dispose of construction-related hazardous materials in a manner consistent with federal, State, and local laws and regulations. At a minimum, this plan shall include those methods recommended by the California Department of Transportation, the CVRWQCB, and the Yolo County Department of Environmental Health. The HMMP shall ensure that staff is trained in the proper method of spill containment and notification of all appropriate jurisdictional agencies, including the local certified unified program agency and the Governor’s Office of Emergency Services.

**Mitigation Measure WQ-2: Implement a spill prevention, control, and countermeasure plan.**

DWR, or its construction contractor, shall develop and implement a spill prevention, control, and countermeasure plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, and petroleum substances during construction and operation activities, as well as minimize the effects of unearthing previously undocumented hazardous materials. The SPCCP shall be completed before any construction activities begin. Implementation of this measure shall comply with State and federal water quality regulations. The SPCCP shall describe spill sources and spill pathways in addition to the actions that shall be taken in the event of a spill (e.g., an oil spill from engine refueling shall be cleaned up immediately with oil absorbents) or the exposure of an undocumented hazard. The SPCCP shall outline descriptions of containment facilities and practices, such as double-walled tanks, containment berms, emergency shut-offs, drip pans, fueling procedures, and spill response kits. It shall also describe how and when employees are trained in proper handling procedures, as well as spill prevention and response procedures.

DWR shall review and approve the SPCCP before onset of construction activities and routinely inspect the construction area to verify that the measures specified in the SPCCP are properly implemented and maintained. DWR shall notify its contractors immediately if there is a non-compliance issue and shall require compliance.

If a spill is reportable, the construction contractor's superintendent shall notify DWR, and DWR shall take action to contact the appropriate safety and cleanup crews to ensure that the SPCCP is followed. A written description of reportable releases shall be submitted to the Central Valley Regional Water Board and the California Department of Toxic Substances Control. This submittal shall contain a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases shall be documented on a spill report form.

### **Mitigation Measure WQ-3: Implement of a stormwater pollution and prevention plan.**

The National Pollutant Discharge Elimination System Program (NPDES) requires projects that would result in ground disturbance of greater than 1 acre to obtain a general construction activity stormwater permit. The NPDES general construction activity stormwater permit generally requires the project applicant to prepare a stormwater pollution prevention plan (SWPPP) that describes the BMPs that shall be implemented to control accelerated erosion, sedimentation, and other pollutants during and after project construction. The SWPPP shall be prepared by the construction contractor prior to initiating construction activities. Specific BMPs that shall be incorporated into the SWPPP shall be site-specific and shall be prepared in accordance with the RWQCB field manual. The SWPPP shall include, but not be limited to, the following standard erosion and sediment control BMPs:

- **Timing of construction.** All construction activities shall occur from May 1 through October 31 to avoid ground disturbance in the rainy season.
- **Stabilize grading spoils.** Grading spoils generated during construction may be temporarily stockpiled in staging areas. Silt fences, fiber rolls, or similar devices shall be installed around the base of the temporary stockpiles to intercept runoff and sediment during storm events. If necessary, temporary stockpiles may be covered with a geotextile material to increase protection from wind and water erosion.
- **Permanent site stabilization.** The construction contractor shall install structural or vegetative methods to permanently stabilize all graded or disturbed areas once construction is complete. Structural methods may include the installation of biodegradable fiber rolls or erosion control blankets. Vegetative methods may include the application of organic mulch and tackifiers and/or an erosion control native seed mix.
- **Staging of construction equipment and materials.** Equipment and materials shall be staged in designated staging areas.
- **Minimize soil and vegetation disturbance.** The construction contractor shall minimize ground disturbance and the disturbance/destruction of existing vegetation. This shall be accomplished, in part, through establishing designated equipment staging areas, ingress and egress corridors, equipment exclusion zones prior to the commencement of any grading operations, and protection of existing trees.
- **Install sediment barriers.** The construction contractor shall install silt fences, fiber rolls, or similar devices to prevent sediment-laden water from leaving the construction area.

### **Mitigation Measure WQ-4: Develop turbidity monitoring program.**

The Basin Plan for the Sacramento River and San Joaquin River basins (Fourth Edition) (Central Valley Regional Water Quality Control Board 2011) contains turbidity objectives. Specifically, the plan states that where natural turbidity is less than 1 nephelometric turbidity unit (NTU), controllable factors shall not cause downstream turbidity to exceed 2 NTUs; where natural turbidity is between 1 and 5 NTUs,

increases shall not exceed 1 NTU; where natural turbidity is between 5 and 50 NTUs, turbidity levels may not be elevated by 20 percent above ambient conditions; where ambient conditions are between 50 and 100 NTUs, conditions may not be increased by more than 10 NTUs; and where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

When water is flowing through the project area, DWR or its construction contractor shall monitor turbidity approximately 500 feet downstream of construction activities to determine whether turbidity is being affected by construction. Grab samples shall be collected at a downstream location that is representative of the flow near the construction site. If there is a visible sediment plume being created from construction, the sample shall represent this plume. A sampling plan shall be developed and implemented based on specific site conditions and in consultation with the CVRWQCB.

If turbidity limits exceed basin plan standards, construction-related earth-disturbing activities shall slow to a point that would alleviate the problem. DWR shall notify the CVRWQCB of the issue immediately and provide an explanation of the cause.

*b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in 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 that would not support existing land uses or planned uses for which permits have been granted)?*

**Less than Significant.** Some excavation, which may temporarily expose the local groundwater table, would be required to modify the Fremont Weir and agricultural road crossings, and to construct the fish passage structure. Dewatering of the construction area near the Fremont Weir fish ladder may be necessary to ensure that the workplace would remain dry, and dewatering would be necessary in the vicinity of the agricultural road crossings during construction. But, this dewatering would not affect the local groundwater table because of its localized and short-term nature. The proposed project construction, operation, and maintenance activities would not involve groundwater extraction or the lowering of the local groundwater table. In addition, construction activities are not likely to interfere substantially with groundwater recharge because construction would occur during the dry season. Therefore, impacts on groundwater supplies and recharge would be less than significant.

*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 that would result in substantial erosion or siltation onsite or offsite? —and—*

*d) 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 onsite or offsite?*

**Less than Significant.** The proposed project includes replacement of the existing fish ladder with a wider and deeper concrete box culvert to provide sufficient width and depth to facilitate adult salmonid and sturgeon passage. Although the proposed structure would have a lower invert, it would be opened only when Fremont Weir begins to overtop. As previously explained, the proposed project would implement two potential operational scenarios once the structure was opened.

- Scenario 2: The fish passage structure remains open for three days after Fremont Weir stops overtopping.

- Scenario 3: The fish passage structure remains open for one day after Fremont Weir stops overtopping and reopens when the river stage falls below 27 feet and closes when the river stage reaches 24 feet, for no longer than five days.

The drainage and inundation pattern associated with proposed project implementation would be the same as existing conditions. Hydrodynamic studies were conducted to analyze the impact of the proposed increased flow from the Sacramento River to the Yolo Bypass through the fish passage structure (Appendix F). Results indicate that changes in the Yolo Bypass drainage and inundation pattern would be negligible and less than significant. Figures 3.10-1 through 3.10-3 show simulated results of the total amount of acres inundated under existing conditions, compared with three operational scenarios for the proposed project for water years in which Fremont Weir overtopping events vary. Based on these results, Scenario 2 and Scenario 3 would have no impact.

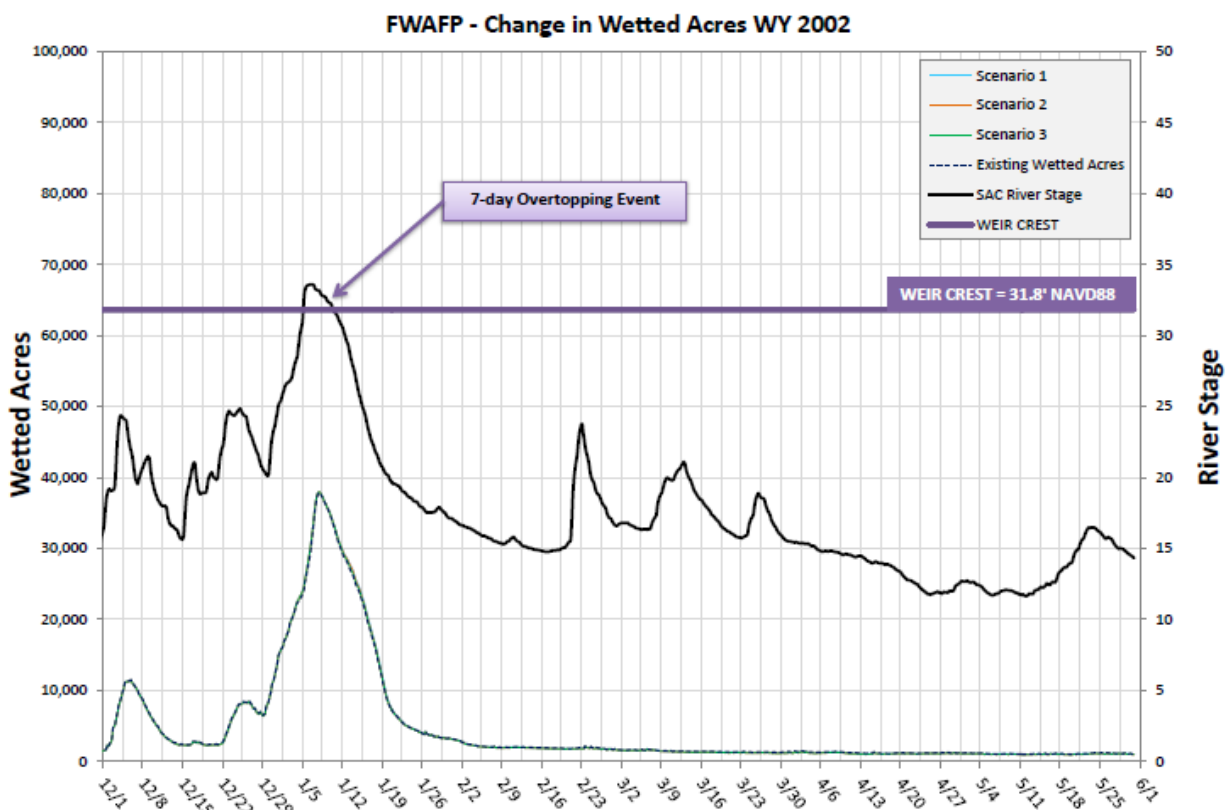
The proposed project also includes modification of a portion of the Fremont Weir stilling basin, the Upstream Channel, Reach 1, and two agricultural road crossings, as well as construction of an equipment platform. The proposed modifications require ground-disturbing activities that would result in minor bank alterations (e.g., engineered streambed material would be placed on the upstream, downstream, and adjacent side slopes of Agricultural Road Crossing 2 and within the modified portions of the channels). These proposed changes are designed to replicate existing drainage patterns and provide erosion resistance. Bank topography changes would be minimal and proposed channel alignments would follow the existing channel. Channel bed alterations would be minor in order to provide enhanced fish passage and to protect against erosion. The course of the Sacramento River waterway would not be changed. In addition, roadway improvements, equipment platform footings, and additional spoil material at either Mt. Meixner or the Elkhorn Area (an area within the northern Elkhorn Basin) would not affect the drainage pattern in the vicinity of the project area. Maintenance activities would remove accumulated debris and sediment to maintain the drainage pattern of the area. Therefore, the impact would be less than significant.

*e) Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?*

**No Impact.** The proposed project would not alter the capacity of existing or planned stormwater drainage systems. In addition, the proposed project would not provide substantial additional sources of polluted runoff (refer to the Mitigation Measure WQ-3: Implementation of a Stormwater Pollution and Prevention Plan). Therefore, there would be no impact.

*g) 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?*

**No Impact.** The proposed project would not involve the construction of houses. There would be no impact.

**Figure 3.10-1 Change in Wetted Acres within the Yolo Bypass — Water Year 2002**

*h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?*

**Less than Significant.** The proposed project includes modification of existing structures and construction of a raised equipment platform. Initial hydrologic and hydraulic modeling conducted by DWR (Appendix G) showed that there would not be any significant increase (greater than 0.01 foot) in water surface elevations in the Yolo Bypass and the adjacent Sacramento River under the 1957-design flood conditions because of implementation of the proposed project. The flow hydrographs at key locations along the Sacramento River (Fremont Weir, Verona Gage, I Street Bridge, Freeport Bridge, Walnut Grove Gage, and Rio Vista Gage) found near-identical results between the existing and proposed project conditions (Appendix G), suggesting that the proposed project would have negligible effects on the overall flow pattern. In addition, no change in velocity was observed between existing conditions and the proposed project alternative at maximum flood stage (Appendix G). The negligible changes in overall flow patterns and water surface elevations indicated in the hydraulic analysis would not impede or redirect flood flows in the Yolo Bypass. Therefore, the impact would be less than significant.

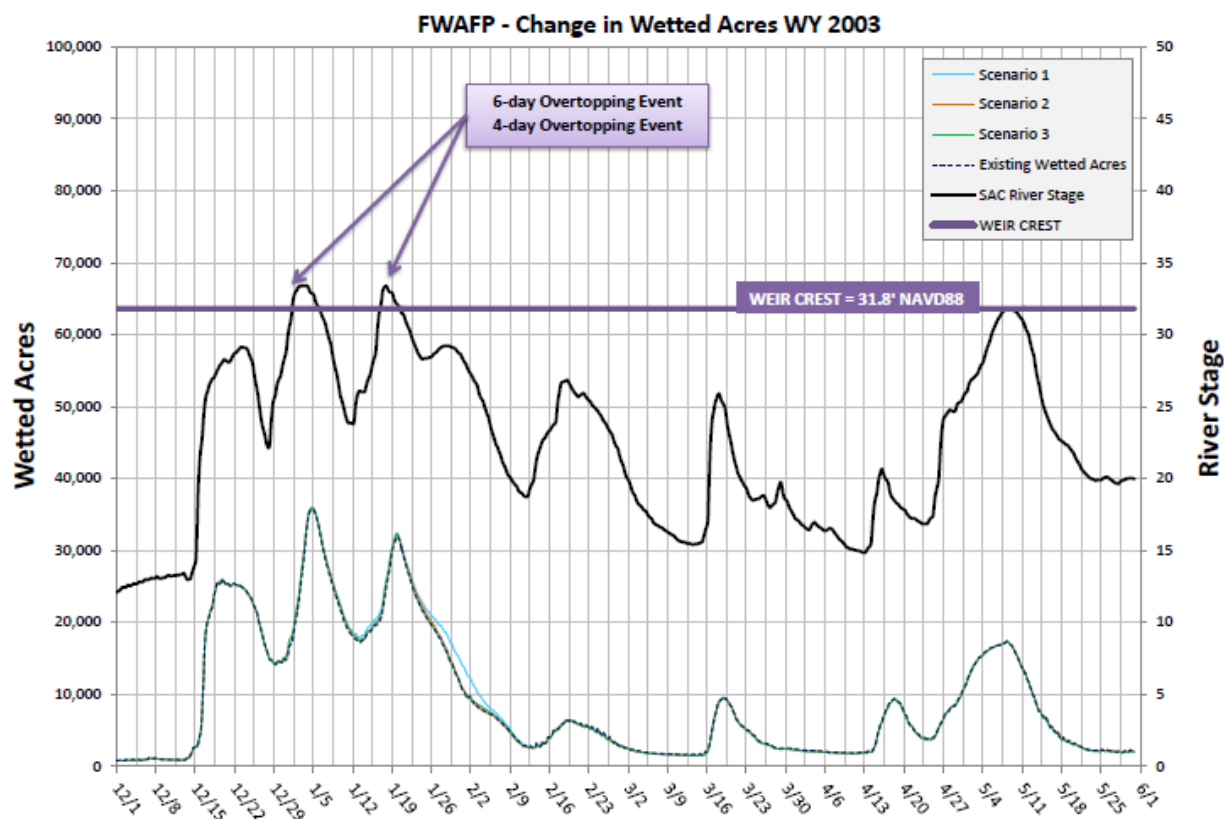
*i) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?*

**Less than Significant with Mitigation Incorporated.** Initial hydrologic and hydraulic modeling conducted by DWR (Appendix G) showed that there would be no significant change (greater than 0.01 foot) in water surface elevations system-wide in the Yolo Bypass and the adjacent Sacramento River because of implementation of the proposed project. In addition, permission for the proposed Fremont

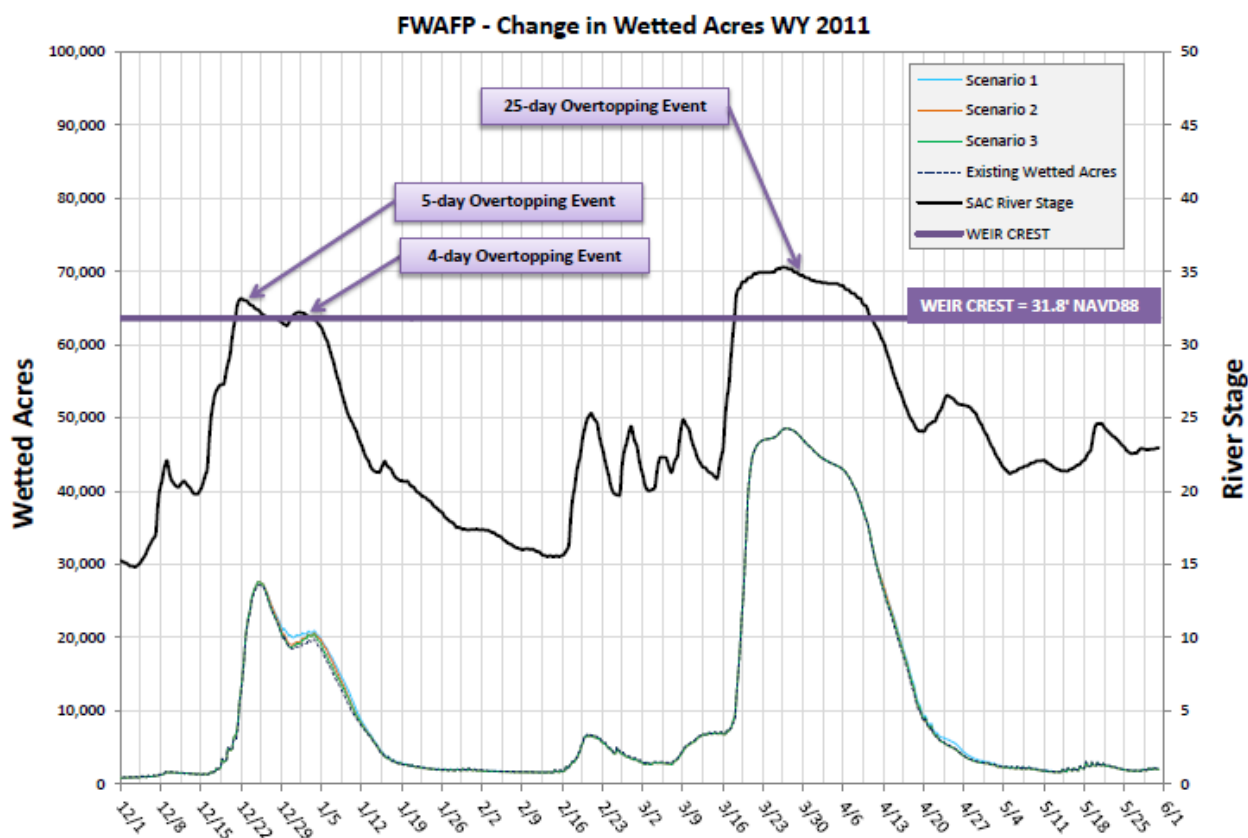


Weir modifications would be obtained from USACE pursuant to Section 14 of the Rivers and Harbors Act of 1899 (Title 33 of the United States Code [USC], Section 408, [33 USC 408]) for the alteration of a federal flood management project to confirm that the project would not reduce the weir's effectiveness as a flood control structure. Therefore, the proposed project would not increase the present potential for failure of any levee, dam, or instream structure.

**Figure 3.10-2 Change in Wetted Acres within the Yolo Bypass — Water Year 2003**



But, because the fish passage structure would have a lower river invert elevation than it currently does, there could be increased flood risk to the downstream users of the FWWA who might not expect the water to come through the structure at lower river stages after Fremont Weir has stopped overtopping under operational Scenario 3. The CDFW FWWA website warns FWWA users not to enter the wildlife area when the river is rising, but FWWA users might see that the Sacramento River water-surface elevation is below the weir elevation and think that it is safe to walk downstream of the fish passage structure. Although this risk would exist for a very brief period of time, between Sacramento River stages of 27 feet and 24 feet, the increased risk would be potentially significant. The proper signage and/or warning signals included in Mitigation Measure WQ-5 would reduce this impact to less than significant.

**Figure 3.10-3 Change in Wetted Acres within the Yolo Bypass — Water Year 2011****Mitigation Measure WQ-5: Place signage and warning signals.**

DWR and its construction contractor, in coordination with the CDFW FWWA manager, shall at minimum place visual warning signage in the FWWA, around the fish passage structure, and at key access points, such as parking lots. If deemed necessary, audible signals, such as alarms or sirens, shall also be installed to signal when the fish passage structure is about to open.

*j) Contribute to inundation by seiche, tsunami, or mudflow?*

**No Impact.** The proposed project would slightly alter the contours of the riverbanks at the project site, but would not involve alterations that would increase susceptibility of surrounding communities to inundation by seiches, tsunamis, or mudflows. Therefore, there would be no impact.

### 3.11 Noise

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

### Glossary of Acoustical Terms

Term	Definitions
decibel, dB	A unit of level that denotes the ratio between two quantities proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
A-weighted sound level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
equivalent continuous noise level, $L_{eq}$	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time varying sound.
$L_{max}$	The maximum A-weighted sound levels measured on a sound level meter during a designated time interval using fast time averaging.
ambient noise level	The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.

Source: Harris 1991

#### 3.11.1 Affected Environment

The proposed modifications to the Fremont Weir fish ladder, construction of an equipment platform, modification of the Upstream Channel and Reach 1, and potential use of the existing Mt. Meixner spoil site would require construction activities within the California Department of Fish and Wildlife's Fremont Weir Wildlife Area (FWWA), an area located within the Yolo Bypass floodway. There are no residences, buildings, or recreational facilities in the FWWA, but the area supports recreational activities, such as hunting and wildlife viewing. A construction buffer would be established in portions of the FWWA to restrict public access during the construction period. Two agricultural road crossings along the east side of the Yolo Bypass, outside of the FWWA, would also be modified. There are no buildings or residences in Yolo Bypass floodway. These road crossings are located on the floodway side of the Yolo Bypass east levee on private land and are surrounded by agricultural lands. A potential spoil site in the Elkhorn Area (an area within the northern Elkhorn Basin) on the east side of the Yolo Bypass east levee may also be used. There are no residences in this area.

Table 3.11-1 shows typical A-weighted sound levels and was used to estimate ambient noise levels within the project area. The ambient noise levels at the proposed Fremont Weir, Agricultural Road Crossing 2, and Agricultural Road Crossing 3 construction sites, and at the potential Mt. Meixner and Elkhorn Area spoil sites, are slightly elevated because of farming activities, and because these sites are under the approach path to Sacramento International Airport. Ambient noise for these areas is estimated at approximately 60–65 decibels (dB). Noise sources include wind in the trees, birds, jet aircraft, and distant and nearby farm equipment.

All proposed construction sites are separated from the nearest sensitive noise receptor by levees and vegetation. The nearest sensitive receptors to construction areas are the residences 1.15 miles west of the Fremont Weir (west of the Yolo Bypass west levee) and 1.17 miles east of Agricultural Road Crossing 3

**Table 3.11-1 Typical A-Weighted Sound Levels**

Common Outdoor Activities	Sound Level (dBA)	Common Indoor Activities
	110	Rock band
Jet flyover at 1,000 feet		
	100	
Gas lawnmower at 3 feet		
	90	
Diesel truck at 50 mph at 50 feet		Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower at 100 feet	70	Vacuum cleaner at 3 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60	
		Large business office
Quiet urban area, daytime	50	Dishwasher in next room
Quiet urban area, nighttime	40	Theater, large conference room (background)
Quiet suburban area, nighttime		
	30	Library
Quiet rural area, nighttime		Bedroom at night, concert hall (background)
	20	
		Broadcast/recording studio
Rustling of leaves	10	
	0	

Source: California Department of Transportation 2013

Note: dBA = A-weighted decibel

(east of the Yolo Bypass east levee). Occasional boat traffic on the Sacramento River passes within 0.1 mile north of the Fremont Weir. The nearest sensitive receptors to the potential Mt. Meixner spoil site are residences 0.7 mile west of the site. These residences are separated from the spoil site by the Yolo Bypass west levee and vegetation. The nearest sensitive receptors to the potential Elkhorn Area spoil site are

residences over 1 mile northeast of the site, which are separated from the spoil site by the Sacramento River levee; the Sacramento River; vegetation; and residences over 1 mile southeast, at the junction of Road 16 and Road 117, which are separated from the spoil site by vegetation.

Access routes to the proposed construction sites at the Fremont Weir fish ladder, Agricultural Road Crossing 2, and Agricultural Road Crossing 3 would be along County Road 117 and County Road 16 to the Yolo Bypass east levee. This route has five sparsely spaced farm residences within 100 feet of the road and four residences that are 100–300 feet from the road. The Mt. Meixner spoil site would be accessed via a new temporary road that would extend from Fremont Weir to the spoil site (within the FWWA). The Elkhorn Area spoil site would be accessed via the Yolo Bypass east levee to agricultural fields just east of the levee and up to 0.75 mile south of Fremont Weir, or to an agricultural field just east of the levee and 0.5 mile northeast of Fremont Weir.

### 3.11.2 Regulatory Setting

#### 3.11.2.1 Federal

There are no federal noise regulations that are applicable to the project.

#### 3.11.2.2 State

There are no State noise regulations that are applicable to the project.

#### 3.11.2.3 Local

##### *County of Yolo 2030 Countywide General Plan*

The Health and Safety Element of the *2030 Countywide General Plan* includes a Noise section (County of Yolo 2009). The plan's noise compatibility goal is to protect people from the harmful effects of excessive noise and recommends adopting a comprehensive noise ordinance that includes standards for construction equipment and noise-emitting construction activities. Still, Yolo County does not have an adopted noise ordinance. The plan does include the Governor's Office of Planning and Research noise compatibility guidelines.

### 3.11.3 Environmental Effects

Construction is expected to occur during daylight hours, typically between 7:00 a.m. and 7:00 p.m., five days per week, and may extend into the evening or weekend during key points of the construction phase. Construction of the proposed fish passage structure and equipment platform, modification of the Upstream Channel and Reach 1, removal of Agricultural Road Crossing 3, and replacement of Agricultural Road Crossing 2 are anticipated to begin in summer 2017.

Table 3.11-2 lists construction equipment that is expected to be used, along with typical noise levels reported in the Federal Highway Administration's publication, *Roadway Construction Noise Model User's Guide* (Federal Highway Administration 2006). The maximum sound levels ( $L_{\max}$ ) measured during monitoring at 50 feet are provided in addition to the typical acoustical use factors. The acoustical use factor is the percentage of time each piece of construction equipment is assumed to be operating at full power (i.e., its noisiest condition) during construction and is used to estimate the equivalent continuous sound level ( $L_{\text{eq}}$ ) values from  $L_{\max}$  values. For example, the  $L_{\text{eq}}$  value for a piece of equipment that operates at full power 50 percent of the time (acoustical use factor of 50) is 3 dB less than the  $L_{\max}$

value for that piece of equipment. Bulldozers and graders can generate noise levels of 87 dBA (average A-weighted noise level at 50 feet). Sound intensity diminishes as distance from the source increases. The sound drop-off rate (attenuation) is 6 dBA/doubling of the distance (California Department of Transportation 2013). At this drop-off rate, sound levels generated within the project area would be below 60 dBA at the nearest sensitive receptor.

**Table 3.11-2 Typical Construction Noise Emission Levels**

Equipment	Typical $L_{max}$ Noise Level (dBA) at 50 feet	Acoustical Use Factor (%)	$L_{eq}$ Noise Level at 50 feet (dBA)
Backhoe	78	40	76
Bulldozer	82	40	81
Chainsaw	84	20	80
Compactor	83	20	76
Compressor (air)	78	40	76
Crane	81	16	80
Dump Truck	76	40	80
Excavator	81	40	81
Front end loader	79	40	75
Generator	73	50	67
Grader	85	40	81
Pump	81	50	74
Scraper	84	40	81
Tractor	84	40	80
Vibratory pile driver	101	20	90

Source: Federal Highway Administration 2006.

Notes: dBA = A-weighted decibel,  $L_{eq}$  = equivalent sound level (Specification 721.560),  $L_{max}$  = maximum sound levels (Federal Highway Administration 2006)

For planning purposes, the *2030 Countywide General Plan* (County of Yolo 2009) includes the Governor's Office of Planning and Research noise compatibility guidelines by land use category. For existing residential uses, noise exposure of up to 60 dB is considered normally acceptable and noise

exposure from 60 to 70 dB is considered conditionally acceptable. For agricultural uses, noise exposure of as much as 75 dB is considered normally acceptable, and noise exposure from 75 to 80 dB is considered conditionally acceptable.

### 3.11.3.1 No-Action Alternative

Under the No-Action Alternative, no modifications would be made to the Fremont Weir fish ladder, Upstream Channel, Reach 1, or the agricultural road crossings along the left bank of the Yolo Bypass east levee. There would be no increase in ambient noise levels associated with construction activities.

### 3.11.3.2 Proposed Project Alternative

*a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or in other applicable local, state, or federal standards?*

**Less than Significant.** Noise levels within the project area would increase because of operation of heavy equipment during construction. The nearest residences to the project construction areas are in the vicinity of the Fremont Weir fish ladder, Agricultural Road Crossing 3, and the potential Mt. Meixner spoil site. The distance of these residences from the project area and the additional noise attenuation from the west and east levees would reduce the temporary construction noise to levels that would not exceed established noise standards. Impacts would be less than significant.

Temporary noise increases would also be generated by the transport of equipment to the construction sites on County Road 117 and County Road 16, with five sensitive receptors located within approximately 100 feet of the roadway. Still, this activity would be consistent with existing heavy-equipment traffic related to farming, which is common on these roads, and the associated noise increase would not exceed established noise standards. The impact would be less than significant.

Operation of the proposed project, which would only occur at the fish passage structure, would not require the use of heavy equipment, would be seasonal and temporary, and would have a negligible effect on local traffic noise levels. Noise associated with proposed project operation would not exceed established standards and would be less than significant.

Maintenance of the proposed project may require the use of heavy equipment, but noise associated with maintenance activities would be similar to existing conditions and would occur at a distance from the nearest residences that would attenuate noise levels below established noise standards. Impacts would be less than significant.

*b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?*

**Less than Significant.** Use of a pile driver during construction would generate groundborne vibration and noise, but not in the immediate vicinity of any residences. The nearest residence to this proposed activity is 1.15 miles away and on the other side of the west levee for the Fremont Weir construction site and the east levee for all other construction sites. Because of the distance and attenuation from this levee, the resident is not likely to be affected by excessive groundborne vibration and noise. Impacts would be less than significant.



Activities associated with operation and maintenance of the proposed project would not generate groundborne vibration or groundborne noise levels, and thus would result in no impact.

*c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?*

**No impact.** Noise associated with construction activities would be temporary, and subsequent operation and maintenance activities within the project area would be similar to existing activities. There would not be a substantial permanent increase in noise levels associated with the proposed project. Thus, there would be no impact.

*d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?*

**Less than Significant.** Construction activities would temporarily increase the ambient noise levels in the project area for the entirety of the construction period. Noise levels associated with construction activities at the Fremont Weir fish ladder, the scour channels, Agricultural Road Crossing 2, and Agricultural Road Crossing 3 would occur more than a mile from any residence. Because of the distance of the project area from these sensitive receptors and the additional noise attenuation from the west and east levees, the temporary increase in ambient noise levels would not be substantial and would be less than significant.

Temporary noise increases would be generated by the transport of equipment to the construction sites on County Road 117 and County Road 16, with five sensitive receptors located within approximately 100 feet of the roadway. Still, this activity would be consistent with existing heavy-equipment traffic related to farming, which is common on these roads, and the associated noise increase would be less than significant. These less-than-significant traffic noise levels would be further reduced with implementation of the best management practices (BMPs) included in Mitigation Measure NOISE-1.

Proposed project operation may require the transport of personnel to operate the gate at the fish passage structure. Noise levels associated with these activities would be temporary, would not be substantial, and would be less than significant.

Maintenance activities may require the transport and use of heavy equipment. Temporary noise increase generated by the transport of equipment to the project area would be consistent with the existing heavy-equipment traffic related to farming in the area, and the maintenance activities would occur at a distance from the nearest receptors that would attenuate noise levels. Noise levels associated with maintenance activities would not be substantial and would be less than significant.

**Mitigation Measure NOISE-1: Implement best management practices to minimize traffic-related noise effects on sensitive receptors.**

The construction contractor shall implement BMPs to minimize traffic-related noise in the vicinity of sensitive receptors. BMPs shall include, but not be limited to, the following measures.

- All construction equipment shall be stored in a designated staging area during the construction phase to eliminate daily heavy-duty truck trips on local roadways.
- To achieve an hourly average noise level below 60 dBA, speed limits and limits on the number of passbys per hour shall be established and enforced for construction vehicle traffic on local roads adjacent to sensitive receptors to minimize traffic noise.

- Construction activities shall be limited to the daytime weekday hours of 7:00 a.m. and 7:00 p.m., to the extent feasible. Construction-related activities outside of these construction hours shall be minimized when located adjacent to sensitive receptors. The construction contractor shall notify Yolo County and/or immediate residents when work is scheduled to extend outside of normal construction times.

*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?*

**No Impact.** The proposed project is not within the land-use plans of the Sacramento International Airport, Watts-Woodland Airport, or the Yolo County Airport, nor is it within 2 miles of a public airport. There would be no impact.

*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?*

**No Impact.** The project site is not within 2 miles of a private airstrip. There would be no impact.

## 3.12 Recreation

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XV. Recreation.</b>				
Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in the permanent loss or closure of well-established recreational facilities or activities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in a substantial reduction of recreation opportunities and experiences (such as a reduction in the amount of area available for a particular type of recreation)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Result in potential inconsistencies with plans and policies related to the protection of recreation resources?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

This section describes existing recreation uses in the vicinity of the proposed project, the various plans and policies related to recreation use in the vicinity of the Sacramento-San Joaquin Delta (Delta) and the Yolo Bypass, and the regulatory agencies that oversee recreation planning and use. Although the proposed project does not include any recreation development, the potential impacts on recreation from implementation of the proposed project are discussed in this section.

### 3.12.1 Affected Environment

#### 3.12.1.1 Regional Recreation

The regional setting for project area recreation includes the surrounding Delta region, the Sacramento River, the Yolo Bypass Wildlife Area (YBWA), and the Sacramento Bypass Wildlife Area (SBWA).

### *Sacramento-San Joaquin Delta Region*

The project area is adjacent to the greater Delta region. The Delta region is approximately 1,150 square miles and provides more than 500 miles of navigable waterways, equaling more than 57,000 navigable surface acres. This vast network of river channels, sloughs, and islands provides a unique and important recreation resource in California.

Recreation uses in the Delta region encompass many activities. Boating and fishing are the most popular, but recreationists also take part in hunting, wildlife viewing, sightseeing, walking, picnicking, and camping. Many of these activities overlap and can be both water- and land-based.

Publicly owned facilities in the Delta region include marinas, several county parks that offer boat ramps, fishing access, camping, picnic sites, and two State park units. Federal wildlife refuges, State wildlife areas, public and private nature preserves, and private hunting clubs are also used for recreation.

### *Sacramento River*

The project area is also adjacent to the Sacramento River. It is the largest river entirely within California and supports the same scope of regional recreational activities as described for the Delta region. In the vicinity of the project area, the Sacramento River is most popular among anglers for striped bass, though Chinook salmon is also a targeted species, as are other warm-water species to various degrees (Tsournos et al. 2016).

### *Yolo Bypass Wildlife Area*

The YBWA is located southeast of the project area, approximately 3 miles east of Davis, directly off of Interstate 80 (California Department of Fish and Wildlife 2016a). It encompasses approximately 16,000 acres and is managed by the California Department of Fish and Wildlife (CDFW). The YBWA is designated “Type A,” meaning it is staffed, is often defined by the presence of wetland habitats, and is intensely managed with extensive vegetation manipulation and water management. Public use of Type A wildlife areas is relatively high and carefully managed by CDFW.

The YBWA is open year-around, sunrise to sunset, except for Christmas Day. It offers hunting and fishing opportunities, but is especially noteworthy in that it also offers a trail and road network that supports an environmental education program, wildlife viewing, and hiking. Located in the heart of the Pacific Flyway, it is described as a haven for fish, waterfowl, shorebirds, wading birds, neotropical migratory birds, raptors, invertebrates, snakes, turtles, toads, and bats. Vegetation community types include managed seasonal and permanent wetland, natural seasonal wetland, natural perennial wetland, and riparian woodland (California Department of Fish and Wildlife 2016a).

Recreational and hunting use in the YBWA can vary from year to year; for example, there were more than 7,200 hunting days in the 2013–2014 season, 6,100 in the 2008–2009 season, and 3,300 in the 2003–2004 season (California Department of Water Resources 2016). The Yolo Bypass Foundation estimates that more than 4,000 students, teachers, and parents visit the area annually to participate in the Discover the Flyway program implemented in partnership with CDFW (Yolo Basin Foundation 2016).

### *Sacramento Bypass Wildlife Area*

The SBWA is located approximately 10 miles south of the project area, immediately adjacent to and east of the Tule Canal. The SBWA provides anglers, hunters, and other visitors access to the east side of the

Tule Canal. Similar to the FWWA, the SBWA is designated “Type C.” Access to SBWA is gained at numerous points from County Roads 126 or 127, though the latter is gated and vehicles are not allowed on that levee road. Road 126 is paved for 1 mile before encountering a gate, restricting further vehicle access along the levee. This gate can also be reached at the south end of Road 124.

This 360-acre State wildlife area is an important cover and feeding area for wildlife during late fall, winter, and early spring. Vegetation varies throughout the area from mature cottonwood trees, willows, and valley oaks in some locations, to a sparsely covered sandy soil area on the east end. Game birds, raptors, songbirds, and native mammals are all present. The Tule Canal offers anglers opportunities to catch white sturgeon, white catfish, and black crappie, while the nearby borrow pits support largemouth bass, bluegill, and white catfish (California Department of Fish and Wildlife 2016b). Hunting is allowed from September 1 through January 31. Primary game species in this wildlife area include waterfowl, pheasant, and dove.

### **3.12.1.2 Project Area Recreation**

There is one State wildlife area located in the project area, and several established recreational activities occur there. Recreational activities also occur immediately adjacent to the project area on the Sacramento River and on the private lands surrounding the agricultural road crossings.

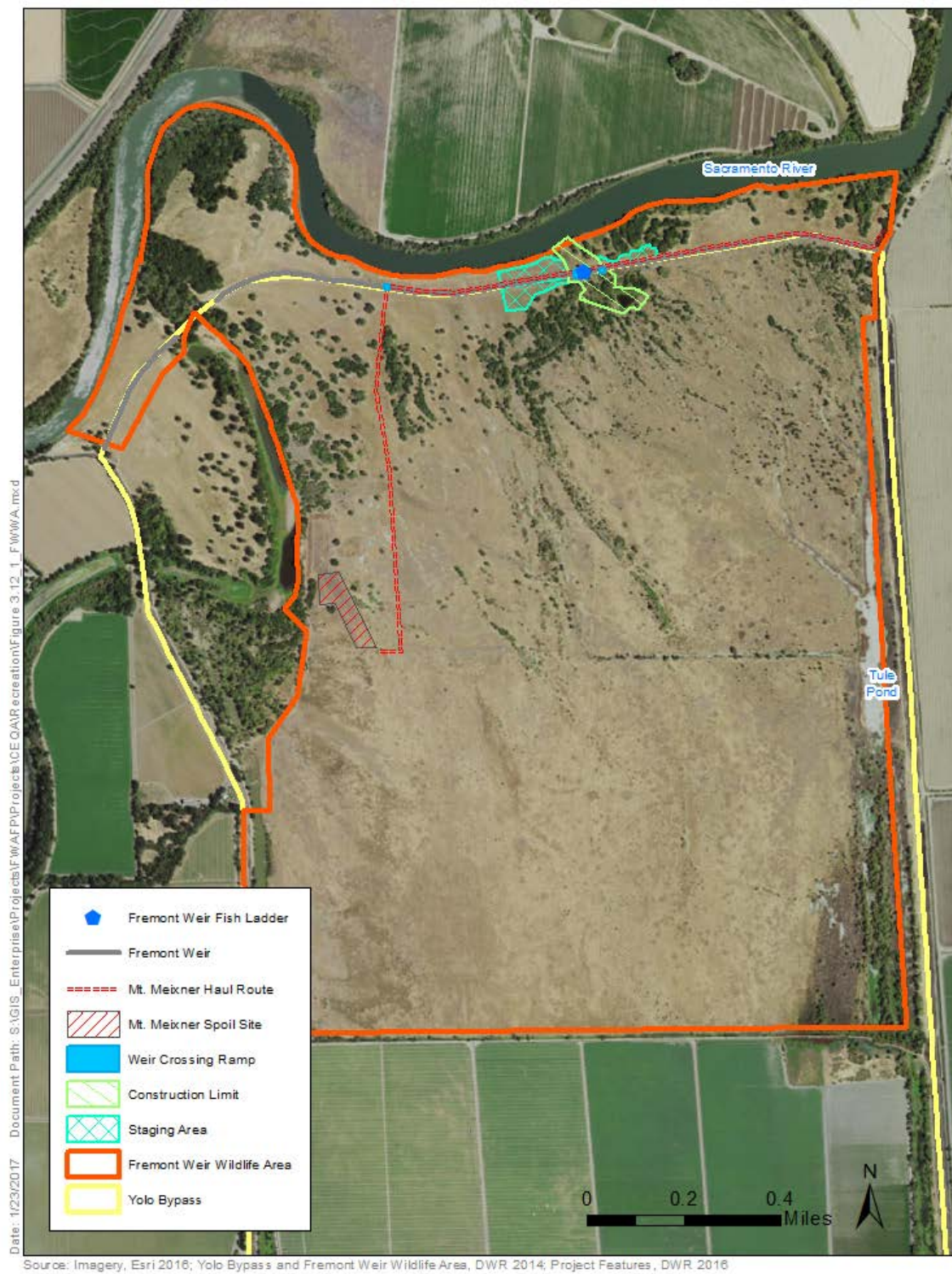
#### *Fremont Weir Wildlife Area*

The Fremont Weir fish ladder, Upstream Channel, Reach 1, and Mt. Meixner portions of the project area are located within the Fremont Weir Wildlife Area (FWWA) (Figure 3.12-1). The FWWA is located about 7.5 miles east of Woodland, and consists of approximately 1,500 acres of tall weedy vegetation, brush, valley oaks, willows, and cottonwood trees (California Department of Fish and Wildlife 2016c). The property was designated as a wildlife area by the California Fish and Game Commission in 1981. At that time fishing and hunting were the major public uses for the area. Those uses continue today, in addition to wildlife viewing, hiking, and other miscellaneous activities. The FWWA is designated “Type C,” meaning it is open for recreation with no permit or fee required and does not have full-time staff dedicated to its daily operation.

The only public entrance to the FWWA is located at the end of County Road 16, which terminates at the parking lot on the Yolo Bypass east levee. Pheasant, dove, valley quail, deer, turkey, and waterfowl are popular game species found at the FWWA. Recreation use of the FWWA is estimated to be 1,500 recreation-days annually, of which about two-thirds are used by hunters (Bush pers. comm. April 29, 2015) during the respective open seasons for various game species. Because the FWWA is in a floodway, it floods when the adjacent Sacramento River reaches water levels sufficient to flow over the Fremont Weir into the Yolo Bypass. The public is cautioned against use of the FWWA lowlands under such conditions (California Department of Fish and Wildlife 2016c).

The hunting seasons for respective game species in the FWWA conform to those of other local and regional public lands. Generally, the most popular periods include the opening of the deer season (archery in mid-August, and general in late-September [Zone D-4]), dove opener on September 1 and re-opener in mid-November, quail beginning in mid-October and pheasant in mid-November, wild turkey in mid-March and in mid-November, and waterfowl season beginning in late October and running through January. For safety reasons, hunters are limited to archery and shotguns only in the FWWA (no rifles or handguns allowed).

**Figure 3.12-1 Location of Proposed Project Construction Areas within the Fremont Weir Wildlife Area**



### *Sacramento River Adjacent to the Project Area*

The Sacramento River supports extensive water-based recreation in the vicinity of the project area (refer to Figure 3.12-1). Angler presence in the area increases in February with the opening of the sturgeon fishing season and remains strong until after October, when the Chinook salmon run declines. Boat fishing is very popular in this area, but this area is distinct from the other sections of the Sacramento River because of a significantly greater proportion and number of shore fishermen (Tsournos et al. 2016).

### *Private Land Recreation in the Vicinity of the Project Area*

In the greater Yolo Bypass there are 17 private duck clubs. Other private recreation facilities in Yolo County include three private marinas and one yacht club, all located well south of the project area (California Department of Water Resources 2013).

## 3.12.2 Regulatory Setting

### 3.12.2.1 Federal

There are no federal plans, policies, or regulations related to recreation that are applicable to the proposed project.

### 3.12.2.2 State

#### *California Department of Parks and Recreation — Recreation Proposal for the Sacramento-San Joaquin Delta and Suisun Marsh*

The Sacramento-San Joaquin Delta Reform Act mandated that the California Department of Parks and Recreation (DPR) develop recommendations to expand State recreation areas in the region. To comply with the legislation, DPR issued the *Recreation Proposal for the Sacramento-San Joaquin Delta and Suisun Marsh* in May 2011. Although the recreation proposal is not a binding policy document, and funding is not currently available to implement the recommendations, the recreation proposal does represent DPR's vision for the region (California Department of Parks and Recreation 2011). The document states, "The proposal recommends a network of recreation areas, including parks, resorts, boating facilities, historic communities, agritourism attractions, and other visitor-oriented businesses. These areas would be connected by scenic driving routes, boating trails, or bicycling and hiking trails. Proposal recommendations aim to provide visitors and residents authentic outdoor experiences rooted in the unique and enduring character of the Delta and Suisun Marsh."

Among recommendations for development and expansion of recreation at several Delta locations, the recreation proposal also recommends working cooperatively with other State agencies, including DWR. Specific areas for DWR recreation consideration relevant to the project site include:

- Incorporate shoreline access, trails, boat ramps, hunting opportunities, and interpretive facilities as appropriate, in restoration projects at Dutch Slough, McCormack-Williamson Tract, Suisun Marsh, and other sites.
- Elkhorn Basin: Create a basecamp by partnering with landowners on the Sacramento River to secure approximately 1,500 acres and restore habitat at the northern end of the Yolo Bypass. Provide campsites, picnic sites, trails, fishing, and interpretive services (the Elkhorn Basin is currently separated from the project area by the Yolo Bypass east levee).



### *California Department of Fish and Wildlife Land Management*

CDFW owns and manages seven areas in the Delta, primarily for habitat and species protection and enhancement. FWWA consists of approximately 1,500 acres situated near the divergence of the Sacramento River and the Yolo Bypass in Yolo County. The SBWA consists of 360 acres between the Tule Canal and Sacramento River in Yolo County. These State wildlife areas are managed under the current regulations found in the California Fish and Game Code and Title 14 of the California Code of Regulations. Regulations for wildlife areas and ecological reserves, as well as hunting and fishing regulations, can also be found in Title 14.

### **California State Lands Commission Regulations**

The California State Lands Commission (SLC) has jurisdiction over lands that underlie navigable and tidal waterways (sovereign lands). Such lands occur under the Sacramento River adjacent to the project area.

The SLC has entered into a memorandum of understanding with DWR to allow DWR access to sovereign lands required for the development, operation, and maintenance of the State Water Project and its related activities and projects.

#### **3.12.2.3 Local**

##### *Yolo County General Plan*

The *Yolo County 2030 Countywide General Plan* (County of Yolo 2009) identifies policies to maintain and expand public access and recreational activities. It notes the existing “resource” parks in the county, several of which are along the Sacramento River, and proposes future parks and trails, including expanded Sacramento River access and trail linkages, a gateway park to the Yolo Bypass, trail linkages along the Sacramento River between Knights Landing and Clarksburg, a gateway park in the Delta region, and a new California Indian Heritage Center. The Conservation and Open Space Element of the plan identifies policies to increase public access, trail linkages, and recreational use along waterways, particularly the Yolo Bypass and the Sacramento River.

Several general plan policies and associated implementation actions specifically address recreation. Policies CO-1.1, CO-1.2, CO-1.3, CO-1.6, and CO-1.8 generally guide planners to coordinate opportunities to expand recreation lands, access, and facilities. Policies CO-1.23 and CO-1.28 mention the Yolo Bypass specifically: “Increase public access and recreational uses along waterways wherever feasible, particularly Cache Creek, Lower Putah Creek, the Yolo Bypass, and the Sacramento River,” and “Balance the needs of agriculture with recreation, flood management, and habitat, within the Yolo Bypass.”

Two general plan implementation actions are related to the project area setting. These include Action CO-A6, “Connect the future Bay Delta Trail system, the future trail system in the lower Yolo Bypass, and the future Cache Creek Parkway system, and link those trails to the American River Bikeway system in Sacramento County,” and Action CO-A11, “Provide recreational uses that are river- or creek-dependent in locations directly on Cache Creek, Putah Creek, and the Sacramento River. Examples include fishing, canoeing, boating, and nature observation. With the exception of boat launches and docks, more active uses, such as parking, restrooms, and picnic areas, shall be located in areas away from the river and sensitive riparian habitat.”



An updated parks master plan is referred to as the document to implement Conservation and Open Space Element goals and policies.

Yolo County also proposed multiple projects with recreation features in its *2007 Integrated Regional Water Management (IRWM) Plan*. The county is currently in the process of merging that plan with plans from neighboring counties as they develop the Westside IRWM Plan, and plan to apply for funding from DWR during a future round of Proposition 1 IRWM implementation grants. Proposed recreation enhancements include the Knights Landing Boat Launch (just north of the project area) and Elkhorn Regional Park. The latter proposes to renovate the southern portion of Elkhorn Regional Park located 8 miles north of West Sacramento. Improvements would include an accessible educational trail, river overlooks, wildlife habitat, interpretive kiosks, and an easement to connect the park to the State's SBWA.

### 3.12.3 Environmental Effects

#### 3.12.3.1 No-Action Alternative

Under the No-Action Alternative, there would be no construction activities that would require the partial closure of the FWWA to recreational activities. There would be no impact.

#### 3.12.3.2 Proposed Project Alternative

Maintenance activities associated with the proposed project would be similar to existing conditions and would not adversely affect recreation opportunities within the project area. Thus, maintenance is not discussed further.

*a) 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?*  
— and —

*b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?*

**Less than Significant.** Closures of portions of the FWWA and areas of private land near the agricultural road crossings would be necessary during the construction period. Construction activities are anticipated to occur from May 1 through November 1, which overlaps with several hunting seasons. The reduced area available for hunting could result in increased hunting use in other areas of the FWWA, or increased use at the YBWA or SBWA. Increased use of recreational areas could result in adverse impacts on the condition of those facilities. But, construction and the associated closures would be temporary, and recreation use levels at the FWWA are relatively low (1,500 recreation days annually), with hunters accounting for approximately two-thirds of those use levels. The potential temporary increase in use levels within other areas of the FWWA or adjacent recreation areas would be minimal, would be temporary, and would not be expected to result in the substantial physical deterioration of the those recreation areas or require the expansion of those recreation areas to accommodate the temporary increase in use levels. Therefore, impacts would be less than significant. In addition, coordination of the closure dates with CDFW, to avoid closures during the opening days of respective hunting seasons (refer to Mitigation Measure REC-1), which are discrete dates when the busiest use typically occurs, would further reduce the amount and impact of displaced use. Proposed project operations would not require the closure of any portion of the FWWA or result in the displacement of recreationists. Thus, no impact would occur.

*c) Result in the permanent loss or closure of well-established recreational facilities or activities?*

**No Impact.** The proposed project would not permanently diminish recreational activities or close existing recreational facilities. There would be no impact.

*d) Result in a substantial reduction of recreation opportunities and experiences (such as a reduction in the amount of area available for a particular type of recreation)?*

**Less than Significant with Mitigation Incorporated.** Proposed project construction would have minor, temporary effects on existing public and private recreation use in the project area. Public use of FWWA lands in the vicinity of construction activities, particularly in the vicinity of Fremont Weir and its stilling basin, as well as Mt. Meixner if it is used as a spoil site, would be limited or prohibited during project construction to ensure the safety of recreationists and construction workers. Although other areas of the FWWA would remain open, there would be a reduction in the amount of area available for recreation during construction.

For the same safety reasons, private land recreation access south of the FWWA property in the vicinity of the agricultural road crossings would be limited or prohibited during the construction period. Private land recreation access in the Elkhorn Area (an area within the northern Elkhorn Basin) may be limited or prohibited if the area is used as a spoil site. Existing recreation opportunities for private landowners and private land users (such as riding, hiking, and hunting) may be reduced during the several-month construction period. Any reduction in the amount of area available for recreation would be temporary and localized.

The temporary interruption of public and private recreational use within the project area because of construction activities without notice would be potentially significant, but implementation of the notification and coordination requirements included in Mitigation Measure REC-1 would reduce this impact to less than significant.

Proposed project operations would not reduce the recreation opportunities and experiences available in the FWWA under existing conditions. Thus, no impact would occur.

#### **Mitigation Measure REC-1: Post Notices of Scheduled Closures and Coordinate Closures with Fremont Weir Wildlife Area Manager**

The construction contractor shall post and distribute notifications at the main FWWA entrance parking area, and at any other local access points, notifying of any scheduled closure of FWWA lands or features at least 30 days in advance of the construction work. Additionally, the construction contractor, in coordination with DWR, shall notify any affected private property owners or lessees if there will be a closure, or other conditions imposed upon entry of their respective private property, in the vicinity of project activities.

The construction contractor shall coordinate with the CDFW FWWA manager at least one week prior to construction, and weekly during construction periods, to ensure that construction closure areas, signage, and non-construction periods are arranged to avoid most hunting or other access conflicts in the FWWA. Construction shall not occur during the first two days and first two weekends of the following hunting seasons (dates represent opening day): archery deer season (August 19), dove season (September 1), regular deer season (September 23), quail season (October 14), and fall upland game season (November

11). The construction contractor shall construct and maintain a temporary no-hunting barrier fence extending 150 yards away from the construction area and provide “no-hunting” signage around the fence, indicating the periods of construction and associated hunting restrictions. The construction contractor shall coordinate with the CDFW FWWA manager regarding periods of construction so the manager can provide CDFW website notifications.

Internal route closures and detours shall be established by the construction contractor during construction at Fremont Weir, as necessary, to ensure public and worker safety.

*e) Result in potential inconsistencies with plans and policies related to the protection of recreation resources?*

**No Impact.** Implementation of the proposed project would result in the temporary closure of portions of the FWWA and the private lands adjacent to the agricultural road crossings or in the Elkhorn Area during construction. During operation of the proposed project, there would be no change in recreational opportunities in these areas from existing conditions. The potential for enhanced or additional developed recreation opportunity would remain, which is consistent with multiple-use and general recreation enhancement policies in the recreation proposal for the Delta and Suisun Marsh, and the *Yolo County 2030 Countywide General Plan*. Therefore, the proposed project would not result in inconsistencies with plans and policies related to the protection of recreation resources. There would be no impact.

## 3.13 Traffic and Transportation

ENVIRONMENTAL ISSUES		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less- than- Significant Impact	No Impact
XVI. Traffic and Transportation.					
Would the project:					
a.	Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b.	Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c.	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d.	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e.	Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f.	Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### 3.13.1 Affected Environment

Fremont Weir and Agricultural Road Crossings 2 and 3 would be accessed via Interstate 5 (I-5), Old River Road, and County Roads 117, 107, and 16 (refer to Figure 2-6 in Chapter 2, “Project Description”). Old River Road, a major two-lane road with moderate-to-high traffic volumes, is not part of a public transit route and does not have a bike lane (County of Yolo 2009). The portions of County Road 107 and County Road 16 within the project area are levee-top roads located behind locked gates.

The potential spoil site within the Elkhorn Area (an area within the northern Elkhorn Basin) would be accessed via a portion of County Road 16, which is located behind locked gates. The potential Mt. Meixner spoil site would be access via County Road 16, the dirt road that parallels Fremont Weir, and a new temporary access road that would be constructed within the Fremont Weir Wildlife Area. All access routes to the potential spoil sites would not be accessible to the public.

Yolo County uses level of service (LOS) criteria to assess the performance of its street and highway system and the capacity of roadways. LOS criteria are defined in Table 3.13-1. The portions of I-5 that would be used for construction and maintenance access are rated by the County as LOS F. Old River Road is rated by the County as LOS D. The remaining roads that would be used for construction and maintenance access are not rated.

**Table 3.13-1 Regulatory Criteria for Roadways and Intersections**

Level of Service	V/C	Description of Traffic Conditions
A	0.00 – 0.60	Conditions of free flow; speed is controlled by the driver's desires, speed limits, or roadway conditions.
B	0.61 – 0.70	Conditions of stable flow; operating speeds beginning to be restricted; little or no restrictions on maneuverability from other vehicles.
C	0.71 – 0.80	Conditions of stable flow; speeds and maneuverability more closely restricted; occasional backups behind left-turning vehicles at intersections.
D	0.81 – 0.90	Conditions approach unstable flow; tolerable speeds can be maintained, but temporary restrictions may cause extensive delays; little freedom to maneuver; comfort and convenience low; at intersection, some motorists, especially those making left turns, may wait through more than one or more signal changes.
E	0.91 – 1.00	Conditions approach capacity; unstable flow with stoppages of momentary duration; maneuverability severely limited.
F	> 1.00	Forced flow conditions; stoppages for long periods; low operating speeds.

Source: Transportation Research Board 2010.

Note: V/C = traffic volume (demand) / roadway capacity ratio

The Yolo County Airport is located over 10 miles west of the project area in an unincorporated area of Yolo County. The Sacramento International Airport is located approximately 3.5 miles southeast of Agricultural Road Crossings 2 and 3. The nearest private airstrips are located approximately 3.4 miles to the northeast of the project area and 3.5 miles to the east of the project area.

### 3.13.2 Regulatory Setting

#### 3.13.2.1 Federal

There are no federal plans, policies, or regulations related to traffic and transportation that are applicable to the proposed project.

#### 3.13.2.2 State

There are no State plans, policies, or regulations related to traffic and transportation that are applicable to the proposed project.

#### 3.13.2.3 Local

##### *County of Yolo 2030 Countywide General Plan*

The Yolo County General Plan's Circulation Element (County of Yolo 2009) has a level-of-service goal that is supported by Policy CI-3.1.

- Maintain Level of Service (LOS) C or better for roadways and intersections in the unincorporated county. In no case shall land use be approved that would either result in worse than LOS C conditions, or require additional improvements to maintain the required level of service, except as specified below. The intent of this policy is to consider level of service as a limit on the planned capacity of the County's roadways.

Still, the General Plan states that the LOS for portions of I-5 and I-80 (LOS F) is acceptable to the County. The General Plan also states that the LOS for Old River Road (LOS D) is acceptable to the County.

### 3.13.3 Environmental Effects

#### 3.13.3.1 No-Action Alternative

Under the No-Action Alternative, construction, operation, and maintenance activities associated with the proposed project would not occur, and there would be no impact on traffic and transportation.

#### 3.13.3.2 Proposed Project Alternative

*a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit? — and —*

*b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways? — and —*

*e) Result in inadequate emergency access?*

**Less than Significant.** The proposed project does not include a land use change that could result in a permanent increase in traffic levels. The proposed project would involve the transport of construction vehicles and equipment to the project area at the start of construction, daily transport of construction workers to and from the project area, intermittent solid waste removal from the project area following concrete demolition, intermittent construction material delivery to the project area, and limited seasonal transport of personnel for operation and maintenance of the project area.

Construction of the proposed project would not require road or lane closures. Construction vehicle traffic associated with implementation of the proposed project along I-5 would blend in with existing traffic levels and would not result in a substantial adverse effect on traffic flow. Construction vehicle traffic may intermittently slow traffic when exiting I-5, or on major roads at intersections where turns are required, but the local roads providing access to the project area are not frequently traveled by standard vehicle traffic. Also, construction vehicles and equipment would be similar to the agricultural vehicles and equipment that use these local roads. Increases in construction-generated traffic on Old River Road would be temporary and would not exceed the LOS threshold accepted by Yolo County for that roadway. Accordingly, the temporary increase in construction traffic would not conflict with a congestion management program or any plans, ordinances, or policies related to measures of effectiveness for the performance of the circulation system, and would not interfere with emergency access. Impacts would be less than significant.

The increase in traffic, although temporary, would have the potential to degrade road conditions along local roads. Degradation of levee roads, if it were to occur, would have a negligible effect on the flow of traffic because of the low speeds traveled on these roads and lack of public access. That said, following completion of construction, the levee roads used for construction access would be repaired to pre-project conditions, if affected by the construction of proposed project. Degradation of Old River Road, which could consist of an increase in the number or size of potholes along the road, could have an effect on the flow of traffic if vehicles slow to avoid the potholes, but the potential effect on traffic flow would not be substantial and would be less than significant. The potential effect of road conditions on traffic flow would be further reduced, if warranted, by implementing the road repair agreement included in Mitigation Measure TRAFFIC-1.

Traffic associated with project-related operation and maintenance activities, which would be seasonal, would be similar to existing conditions and would not result in a substantial adverse effect on traffic and transportation. Impacts would be less than significant.

**Mitigation Measure TRAFFIC-1: Enter into a Road Repair Agreement with Yolo County.**

DWR, Reclamation, and the construction contractor shall enter into a road repair agreement with the Yolo County Public Works Division. The agreement shall include post-construction road repair measures to return County roads adversely affected by project-related traffic to pre-project conditions. Pre-project conditions shall be documented by DWR, Reclamation, and the construction contractor prior to the start of construction. Road repair measures may include, but not be limited to, chip sealing and reconstruction of any disturbed road shoulders.

*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?*

**No Impact.** The proposed project would not have the potential to affect air traffic patterns, resulting in no impact.

*d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?*

**No Impact.** The proposed project does not include alterations or design features for public roads. Equipment and material transport for the proposed project would not result in incompatible uses of public roads because these roads are frequently traveled by large farm equipment. There would be no impact.

*f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?*

**No Impact.** Designated bicycle and pedestrian facilities do not exist along the proposed access routes, and project-related construction, operation, and maintenance would not conflict with any future policies, plans, or programs that support alternative transportation. There would be no impact.



### 3.14 Tribal Cultural Resources

ENVIRONMENTAL ISSUES		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less- than- Significant Impact	No Impact
XVII. Tribal Cultural Resources.					
Would the project:					
a.	Cause a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resources Code 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i)	Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources code section 5020.1(k), or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii)	A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### 3.14.1 Affected Environment

According to University of California, Berkeley, ethnographer Alfred Kroeber (1932), the project area falls between ethnographically reported Patwin and Nisenan villages. Heizer and Hester (1970) also present information naming the Patwin village of Yo'doi at Knights Landing and the Nisenan village of Hol'lo-wi near the historic town of Fremont. However, the Native American Heritage Commission (NAHC) has assigned Patwin individuals as Most Likely Descendants for two separate sites with human remains in the project vicinity (but outside of the project footprint). Both the Yocha Dehe Wintun Nation (Patwin) and the United Auburn Indian Community of the Auburn Rancheria (UAIC) (Nisenan and Miwok) claim cultural and traditional affiliation with the project area.

Project notification letters and invitations to consult on the project were sent by certified mail to the four tribes on DWR's Assembly Bill (AB) 52 tribal consultation list for Yolo County: the UAIC, the Wilton Rancheria, the Yocha Dehe Wintun Nation, and the Ione Band of Miwok. Both the Yocha Dehe Wintun Nation and the UAIC accepted the invitation to consult under AB 52.

The Native American Heritage Commission (NAHC) was contacted on July 12, 2016, regarding sacred lands within the project area. The NAHC conducted a search of the Sacred Lands File on July 25, 2016, and reported that they have no records of Native American cultural resources within the project area.

A consultation meeting with the UAIC was held on August 19, 2016, at the Cultural Resources Office in Auburn, California. The UAIC representative stated the UAIC has tribal cultural resources (TCRs) in the project area.

A consultation meeting was held at the Yocha Dehe Tribal Offices in Brooks, California, on September 16, 2016. The Yocha Dehe representatives stated they have TCRs in the project area. The Yocha Dehe are concerned about the proximity of proposed project elements to a TCR. They are also concerned that unrecorded sites may be discovered and damaged during project construction.

### 3.14.2 Regulatory Setting

#### 3.14.2.1 Federal

There are no federal plans, policies, or regulations related to tribal cultural resources that are applicable to the proposed project.

#### 3.14.2.2 State

##### *California Environmental Quality Act — Statute and Guidelines*

CEQA requires that public agencies that finance or approve public or private projects must assess the effects of the project on tribal cultural resources. Tribal cultural resources are defined in Public Resources Code (PRC) 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe that is (1) listed or determined eligible for listing on the California Register of Historical Resources (CRHR) or a local register, or (2) that are determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe.

##### *California Public Resources Code Section 5024*

PRC Section 5024.1 establishes the CRHR, which is the authoritative guide for identifying the state's historical resources to indicate what properties are to be protected, if feasible, from substantial adverse change.

For a resource to be eligible for the CRHR, it must be more than 50 years old, retain its historic integrity, and satisfy all of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

2. Is associated with the lives of persons important in our past.
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. Has yielded, or may be likely to yield, information important in prehistory or history.

#### *Consultation with California Native American Tribes*

Under PRC section 21080.3.1 and 21082.3, the State must consult with tribes traditionally and culturally affiliated with the project area that have requested formal notification and responded with a request for consultation. The parties must consult in good faith. Consultation is deemed concluded when the parties agree to measures to mitigate or avoid a significant effect on a tribal cultural resource when one is present or when a party concludes that mutual agreement cannot be reached. Mitigation measures agreed on during the consultation process must be recommended for inclusion in the environmental document.

#### **3.14.2.3 Local**

There are no local plans, policies, or regulations related to tribal cultural resources that are applicable to the proposed project.

#### **3.14.3 Environmental Effects**

##### **3.14.3.1 No-Action Alternative**

Under the No-Action Alternative, construction, operation, and maintenance activities associated with the proposed project would not occur. There would be no impact on tribal cultural resources.

##### **3.14.3.2 Proposed Project Alternative**

Proposed operation and maintenance activities would be similar to existing conditions and would not adversely affect tribal cultural resources. Thus, project operation and maintenance are not discussed further for this resource.

*a) Cause a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resources Code 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:*

1. 1. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources code section 5020.1(k), or
2. 2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

**Less than Significant with Mitigation Incorporated.** No human remains or archaeological contexts have been identified in the APE. Because geoarchaeological testing in the APE did not find archaeological materials, it is unlikely that human remains would be encountered during construction activities. But, the potential to unearth archaeological contexts or human remains during construction still exists. Ground-disturbing activities have the potential to result in the discovery of, or inadvertent damage

to, archaeological contexts or human remains, and this possibility cannot be completely eliminated. Consequently, there is a potential for significant impacts on tribal cultural resources. Although tribal consultation is ongoing as of February 3, 2017, the current assessment is that impacts would be less than significant with mitigation incorporated. Implementation of the mitigation measures listed below and described in Section 3.6, “Cultural Resources,” are expected to reduce potential impacts to less-than-significant levels.

**Mitigation Measure CUL-1: Conduct cultural resources awareness training.**

**Mitigation Measure CUL-2: If archaeological resources are discovered, cease construction activities and implement appropriate treatment measures.**

**Mitigation Measure CUL-3: Retain Native American monitors before conducting ground-disturbing activities.**

**Mitigation Measure CUL-4: If human remains are found, cease construction activities and implement appropriate procedures for the treatment of remains.**

### 3.15 Utilities and Service Systems

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

### 3.15.1 Affected Environment

Utilities and service systems include water supply, wastewater and storm drainage facilities, landfills, and electrical supply.

Water supply to the agricultural fields within the project area is provided by water impoundment structures (agricultural road crossings) in the Tule Canal. Environmental water supply within the Yolo Bypass, such as for fish passage, consists of out-of-channel flows from four Yolo Bypass westside tributaries and Sacramento River flows overtopping Fremont Weir and Sacramento Weir.

There are no wastewater treatment facilities or stormwater drainage facilities within, or serving, the project area.

The Yolo County Central Landfill, approximately 24 driving miles southwest of the project area and located in Woodland, is the closest landfill to the project area. It is a Class III solid waste landfill that provides solid waste disposal, salvage, and recycling services. Based on available capacity and existing waste-disposal rate, the landfill is estimated to continue to operate through January 1, 2081 (County of Yolo 2009).

### 3.15.2 Regulatory Setting

#### 3.15.2.1 Federal

There are no federal plans, policies, or regulations related to utilities and service systems that are applicable to the proposed project.

#### 3.15.2.2 State

##### *California Integrated Waste Management Act of 1989*

The California Integrated Waste Management Act of 1989 (Public Resources Code, Division 30), enacted through Assembly Bill (AB) 939, emphasizes conservation of natural resources through reduction, recycling, and reuse of solid waste. AB 939 required each local jurisdiction to divert 25 percent of solid waste from landfills by 1995 and 50 percent by 2000; established a comprehensive statewide system of permitting, inspections, enforcement, and maintenance for solid waste facilities; and authorized local jurisdictions to impose fees based on the types or amounts of solid waste generated.

#### 3.15.2.3 Local

##### *County of Yolo 2030 Countywide General Plan*

The Public Facilities and Services Element of the Yolo County General Plan (County of Yolo 2009) includes policies related to solid waste and recycling that support the goal of providing safe, cost-efficient, and environmentally responsible solid waste management. Policy PF-9.8 requires salvage, reuse, or recycling of construction and demolition materials and debris at all construction sites.

### 3.15.3 Environmental Effects

#### 3.15.3.1 No-Action Alternative

Under the No-Action Alternative, construction, operation, and maintenance activities associated with the proposed project would not occur. There would be no impact on utilities and service systems.

### 3.15.3.2 Proposed Project Alternative

*a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board? — and —*

*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? — and —*

*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?*

**No Impact.** There are no wastewater treatment facilities in the project area, and the proposed modifications to the existing fish ladder, scour channels, and agricultural road crossings would not require wastewater treatment. Thus, no impact would occur.

*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?*

**No Impact.** The project area is located in the Yolo Bypass, which is designed to convey floodwaters from the Sacramento River. As such, there are no stormwater drainage facilities in the project area, and none would be required by the proposed project. Thus, no impact would occur.

*d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?*

**Less than Significant.** The proposed project would convey flow from the Sacramento River, through the fish passage structure, and into the Yolo Bypass immediately before and after overtopping events at the Fremont Weir. Generally, this structure would operate during high-flow periods during the wet season. To determine whether water supplies would be affected as a result of the project, the CalSim-II model analyzed whether the project would affect downstream users. CalSim-II modeling results show that sufficient water supplies are available for the approximately 1,100 cubic feet per second (cfs) increase in additional flows that would enter the Yolo Bypass through the fish passage structure, as the structure would be operational only during high-flow events on the Sacramento River. Scenarios were evaluated with different operational end dates over an 82-year simulation period (1922–2003), and the results show that project flows through the fish passage structure would occur when the Sacramento-San Joaquin Delta (Delta) is in excess conditions. Delta excess conditions are defined in the “Agreement Between the United States of America and the State of California for Coordinated Operation of the Central Valley Project and State Water Project” (commonly referred to as the “Coordinated Operations Agreement,” or “COA”), as “periods when it is agreed that releases from upstream reservoirs plus unregulated flow exceed Sacramento Valley in basin uses, plus exports.” Project flows would not affect other users because project operation would occur when the amount of water in system is in excess of existing uses.

Furthermore, the scenarios were post-processed to identify whether any diverted water through the structure was classified as stored water from Central Valley Project (CVP) or State Water Project (SWP) facilities. Less than 1 percent of the time during the 82-year simulation did the results show that CVP or SWP water was diverted through the structure; however, this was under extremely wet hydrologic conditions, where the Fremont Weir was being overtopped and both Shasta and Oroville dams were spilling (Appendix G). Hydrodynamic modeling simulations also indicate that the additional flow through the proposed fish passage structure onto the Yolo Bypass would not significantly decrease water surface elevations or flow in the downstream Sacramento River (Appendix F). Figures 3.15-1 through 3.15-8

compare the impact of the proposed project on flow and water surface elevation over existing conditions along the Sacramento River at four locations for Water Year 1997: at 1.7 miles upstream of Fremont Weir, at immediately upstream of Fremont Weir, at Verona Gage, and at 12.8 miles upstream of the Sacramento Weir. The hydraulic analyses indicate that there is no noticeable difference in simulated results between existing conditions and proposed project conditions during periods of time when water availability may be a concern. The biggest deviation in flow results is indicated at Verona and represents an approximate 2-percent to 4-percent reduction in flow. The small reduction in flow results from the fact that the fish passage structure would only be operated during a Fremont Weir overtopping event and for a short period after the weir stops overtopping. That said, during this period the river system is in flood conditions and approximately 50,000 cfs still remains in the Sacramento River downstream of the proposed project. During these flow conditions, water availability would not be an issue. Therefore, the impact would be less than significant.

*f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs? — and —*

*g) Comply with federal, state, and local statutes and regulations related to solid waste?*

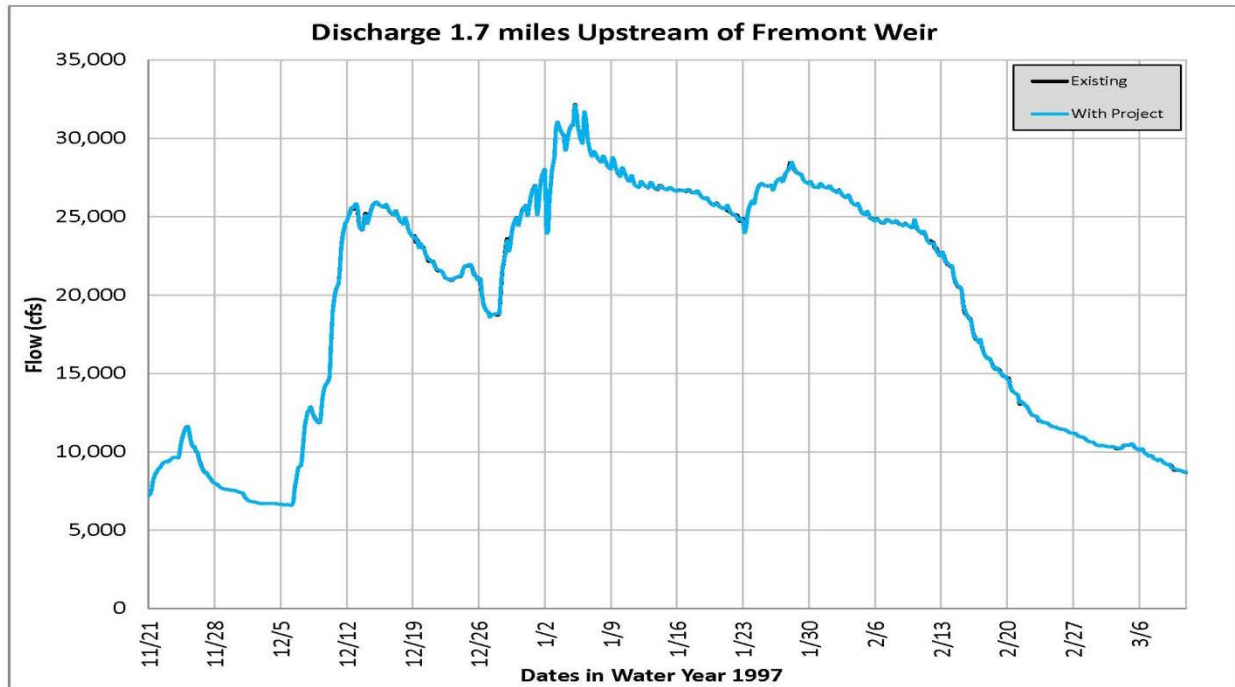
**Less than Significant.** Although excavated sediment would be spoiled at either Mt. Meixner or in the Elkhorn Area (an area within the northern Elkhorn Basin), proposed construction activities would generate solid waste that would need to be disposed of at the local landfill. Solid waste would potentially include concrete, culverts, and vegetation. Project-generated solid waste would be disposed of in compliance with solid waste statutes and regulations at the Yolo County Central landfill, which has permitted capacity to accommodate the amount and type of waste. Impacts on the landfill capacity would be less than significant.

*h) Be served by a utility with sufficient capacity to accommodate the project's energy requirements?*

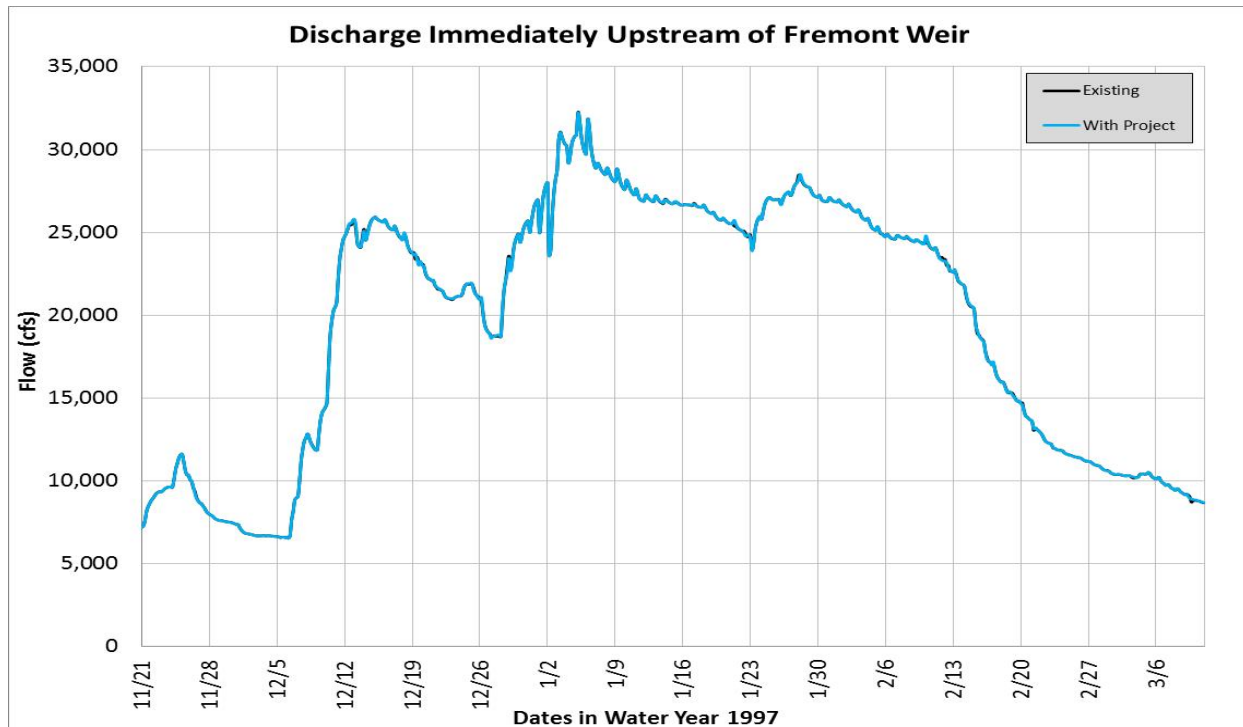
**Less than Significant.** The proposed project would utilize solar power at the Fremont Weir fish ladder and would have no effect on existing utilities. There would be no impact.



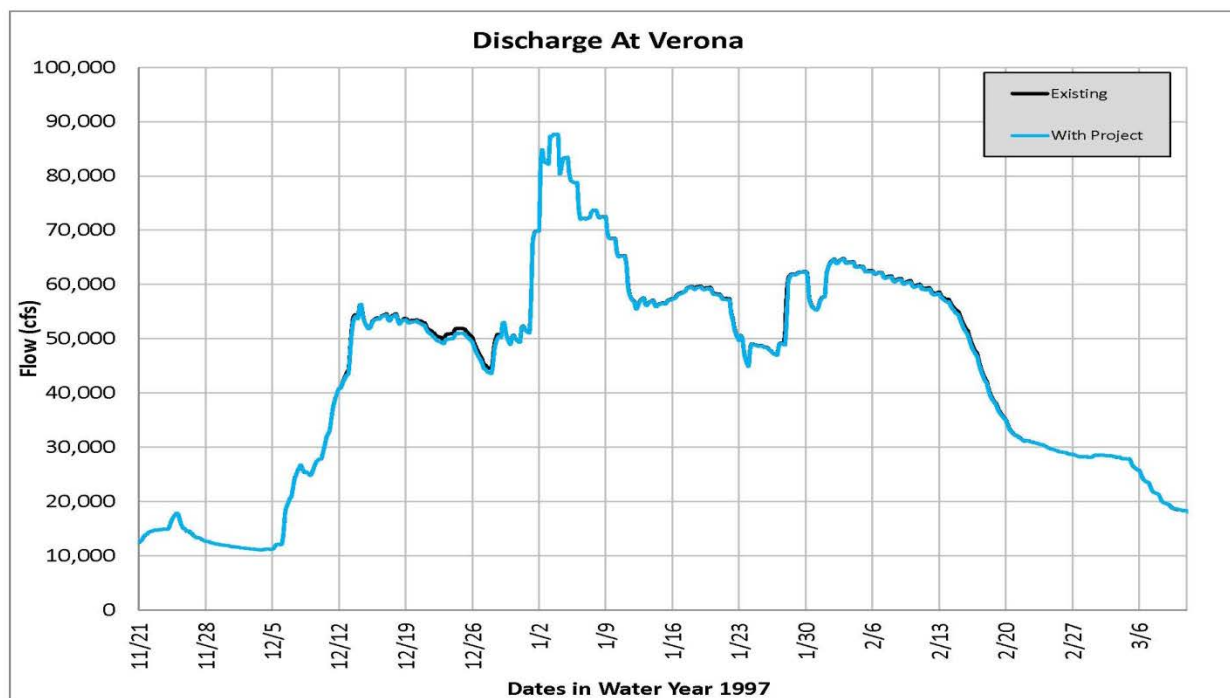
**Figure 3.15-1 Comparison of Flows (Discharge) between Existing and Proposed Project Conditions for Water Year 1997 in the Sacramento River at 1.7 Miles Upstream of Fremont Weir**



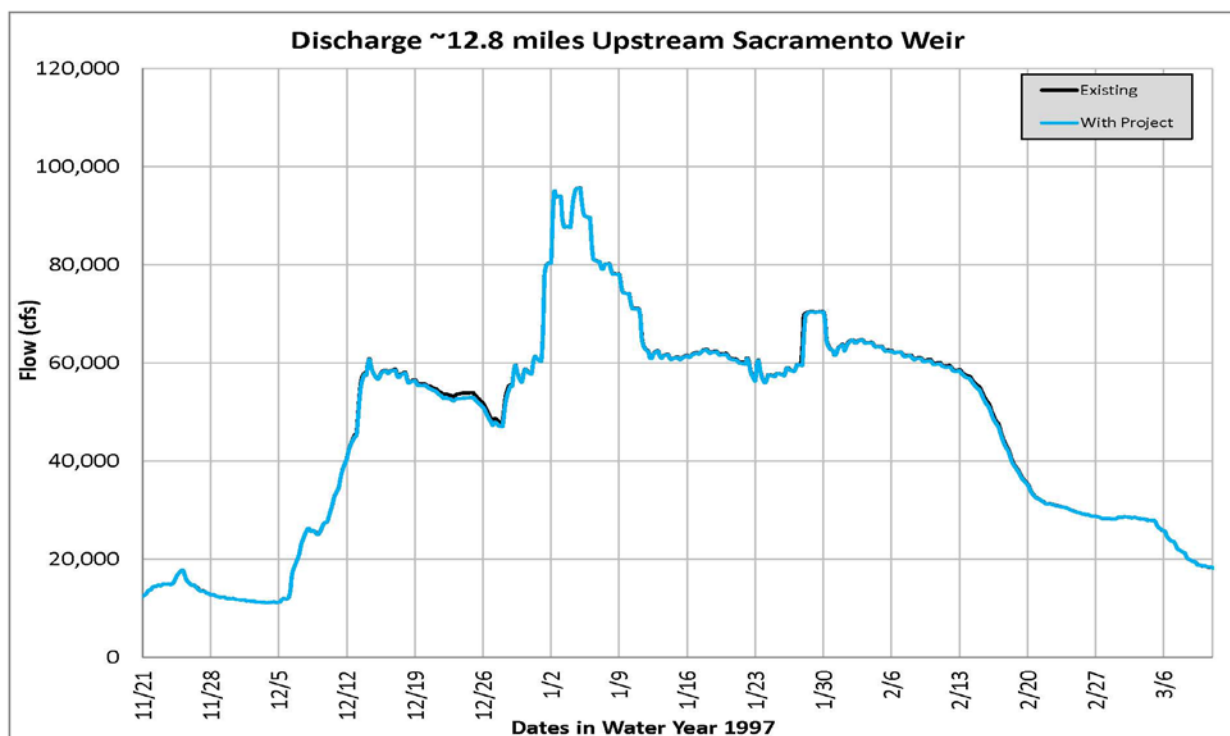
**Figure 3.15-2 Comparison of Flows (Discharge) between Existing and Project Conditions for Water Year 1997 in the Sacramento River Immediately Upstream of Fremont Weir**



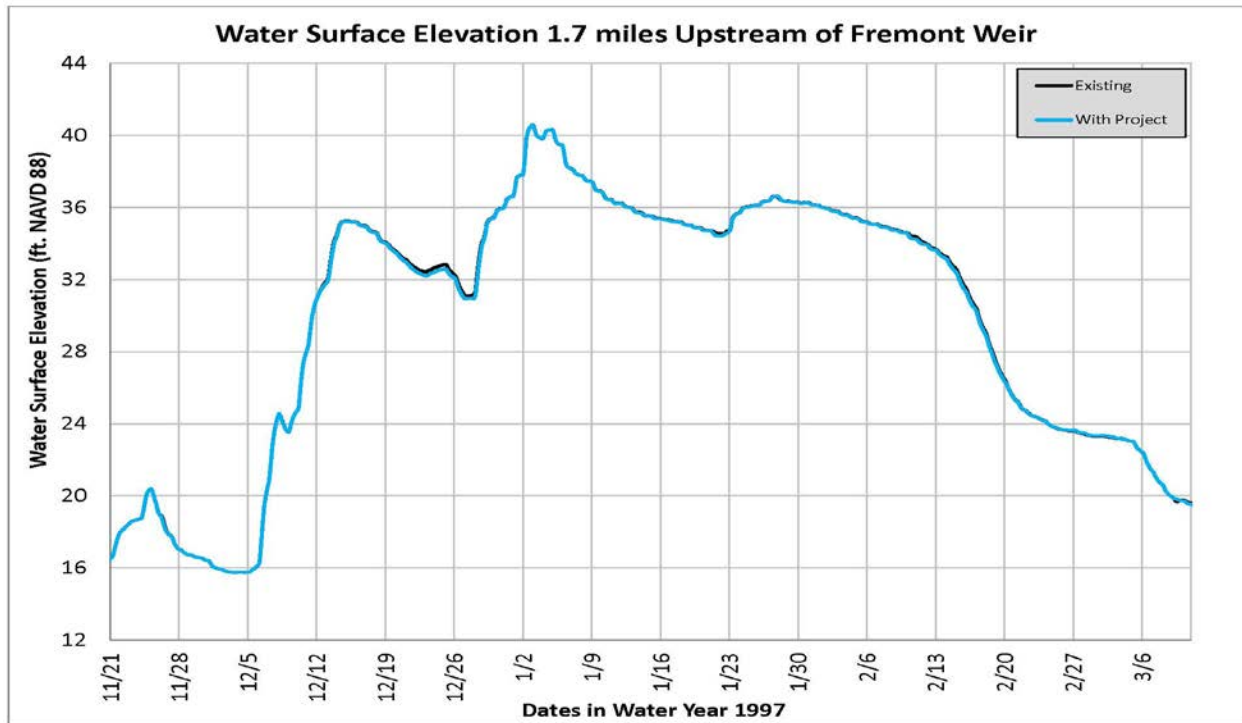
**Figure 3.15-3 Comparison of Flows (Discharge) between Existing and Project Conditions for Water Year 1997 in the Sacramento River at Verona Gage**



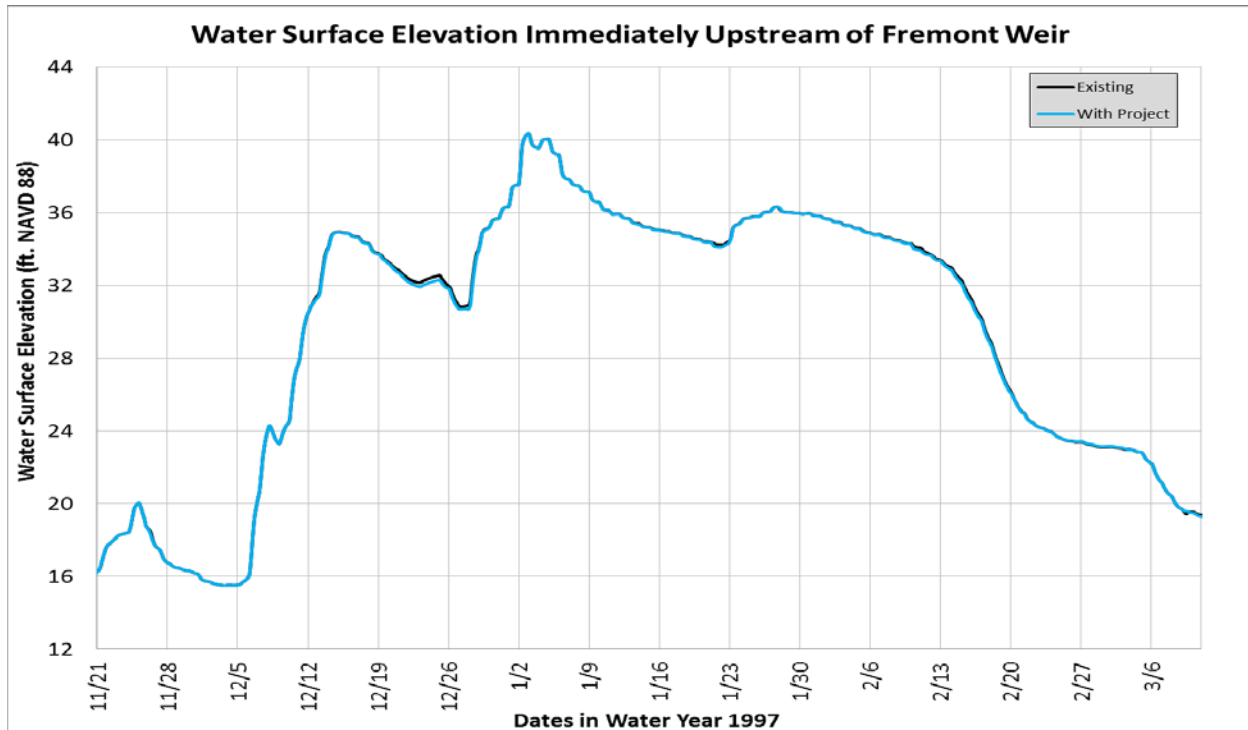
**Figure 3.15-4 Comparison of Flows (Discharge) between Existing and Project Conditions for Water Year 1997 in the Sacramento River at 12.8 Miles Upstream of Sacramento Weir**



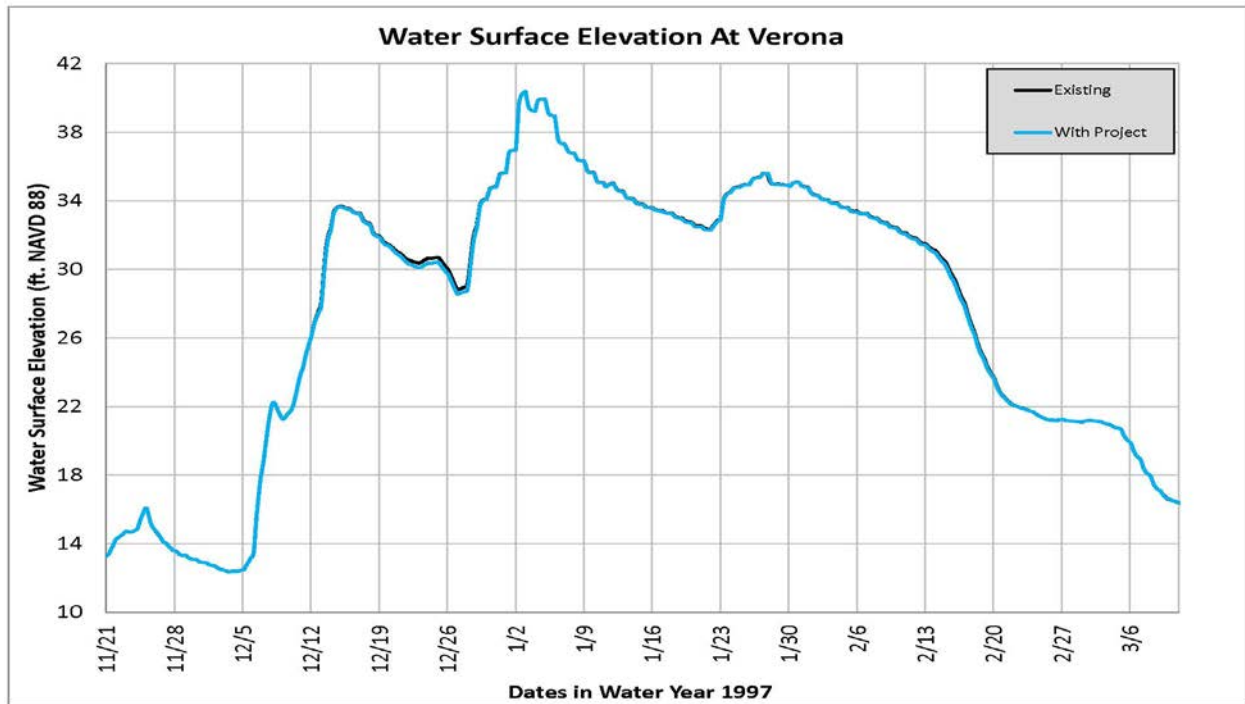
**Figure 3.15-5 Comparison of Water Surface Elevations between Existing and Project Conditions for Water Year 1997 in the Sacramento River at 1.7 Miles Upstream of Fremont Weir**



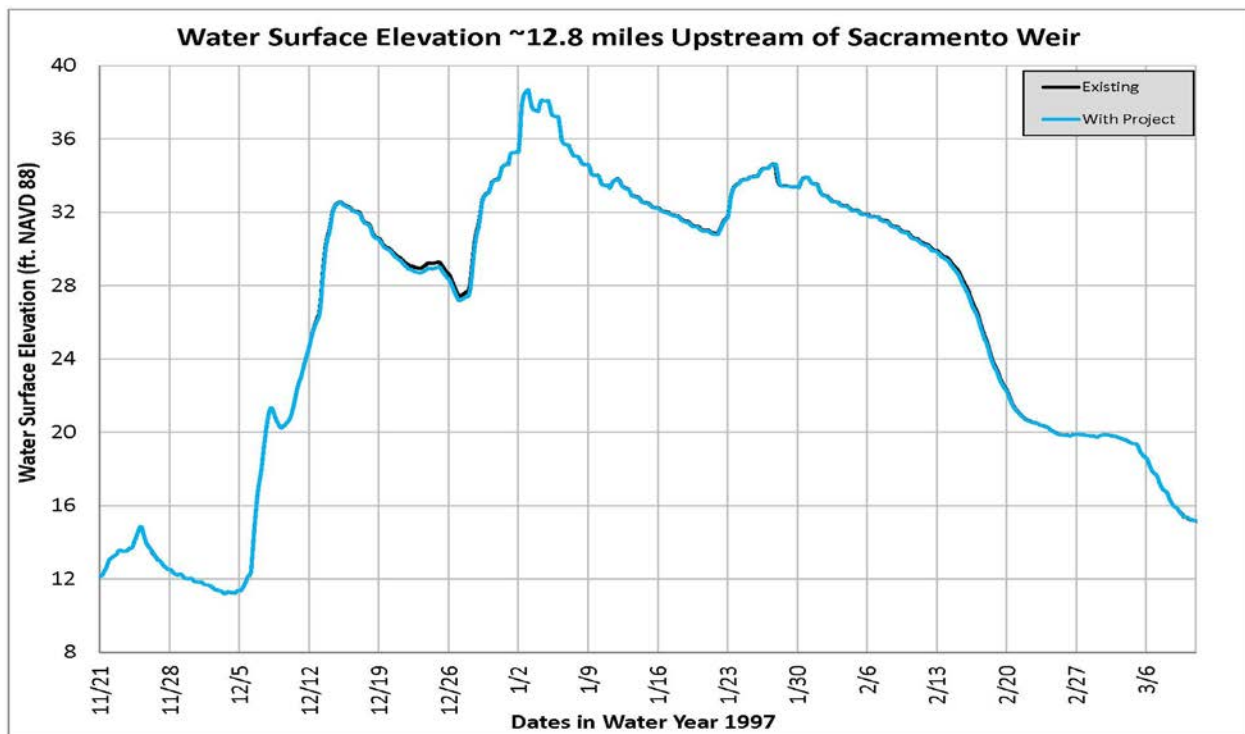
**Figure 3.15-6 Comparison of Water Surface Elevations between Existing and Project Conditions for Water Year 1997 in the Sacramento River Immediately Upstream of Fremont Weir**



**Figure 3.15-7 Comparison of Water Surface Elevations between Existing and Project Conditions for Water Year 1997 in the Sacramento River at Verona Gage**



**Figure 3.15-8 Comparison of Water Surface Elevations between Existing and Project Conditions for Water Year 1997 in the Sacramento River at 12.8 Miles Upstream of Sacramento Weir**



### 3.16 Mandatory Findings of Significance

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

#### 3.16.1 Regulatory Setting

CEQA Guidelines Section 15065 states that the lead agency shall find that a project may have a significant effect on the environment, and thus require that an environmental impact report (EIR) be prepared for the project, where there is substantial evidence, in light of the whole record, that any of the above conditions (checklist items a through c) may occur. Prior to commencement of the environmental analysis, when a project proponent agrees to mitigation measures or project modifications that would avoid any significant effect on the environment or would mitigate the significant environmental effect, a lead agency need not prepare an EIR solely because, without mitigation, the environmental effects would have been significant.

#### 3.16.2 Environmental Effects

##### 3.16.2.1 No-Action Alternative

Under the No-Action Alternative, no construction activities would occur to improve fish passage and thus no new environmental impacts would contribute to cumulative effects. Nonetheless, under this alternative, migratory delays and mortality of federally listed and State-listed adult fish species within the Yolo Bypass would continue to occur, and partial compliance with Reasonable and Prudent Alternative (RPA) Action I.7 of the 2009 National Marine Fisheries Service's *Biological Opinion and Conference*

*Opinion on the Long-Term Operations of the Central Valley Project and State Water Project would not be achieved.*

### **3.16.2.2 Proposed Project Alternative**

*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? — and —*

*b) Does the project have impacts that are individually limited but cumulatively considerable? (“Cumulatively considerable” meant that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of the other current projects and the effects of probable future projects)? — and —*

*c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?*

**Less than Significant with Mitigation Incorporated.** As discussed in sections 3.2, “Aesthetics,” through 3.15, “Utilities and Service Systems,” the proposed project would not have significant and permanent adverse effects on the environment. The proposed project would have potentially adverse effects on air quality, biological resources, cultural resources, geology, hazards and hazardous materials, water quality, noise, recreation, and tribal cultural resources. These impacts would be reduced to less-than-significant levels, however, with implementation of avoidance and minimization measures and by incorporating mitigation measures. A summary of the mitigation measures is provided in Appendix C, “Mitigation Monitoring and Reporting Program.” The proposed project would not result in cumulatively considerable impacts (refer to Chapter 4.0, “Cumulative Impacts”). Based on the findings of this IS/EA, the proposed project would not 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 a self-sustaining level, 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, or have environmental effects that would cause substantial adverse effects on human beings. The proposed project is intended to provide enhanced fish passage opportunities for federally listed and State-listed salmonids and green sturgeon during and immediately following a Fremont Weir overtopping event, reduce the reliance on fish rescue in the Fremont Weir Wildlife Area, and improve fish passage in the Tule Canal.

## 4.0 Cumulative Impacts

*Cumulative impacts* are the impacts on the environment that result from the incremental impacts of a proposed action when added to the impacts of other past, present, and reasonably foreseeable future actions (CEQA Guidelines Section 15355[b]; 40 Code of Federal Regulations [CFR] 1508.7). These impacts can result from individually minor but collectively significant actions taking place over time.

The CEQA Guidelines and NEPA regulations require that the cumulative impacts of a proposed action be addressed in an environmental document when the cumulative impacts are expected to be significant (40 CFR 1508.25[a][2]; 14 California Code of Regulations [CCR] 15130[a]). When a lead agency is examining a project with an incremental effect that is not “cumulatively considerable,” the lead agency need not consider that effect significant, but should briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

The following projects and plans have been identified as having the potential to affect the same resources as the proposed project. They include flood management projects affecting the Sacramento River and the Yolo Bypass; habitat restoration and other water-related projects that could affect fish, other wildlife species, and vegetation in the Yolo Bypass; and other nearby infrastructure projects that could result in adverse or beneficial effects similar to those of the proposed project.

- **Central Valley Flood Management Planning Program.** DWR launched the Central Valley Flood Management Planning (CVFMP) Program in 2008 to improve integrated flood management in California’s Central Valley. The CVFMP Program efforts include the preparation of the Central Valley Flood Protection Plan (CVFPP) to fulfill the requirements of the Central Valley Flood Protection Act of 2008 (California Department of Water Resources 2016a).
  - **Central Valley Flood Protection Plan.** The CVFPP (California Department of Water Resources 2012) was prepared by DWR in coordination with local flood management agencies, the Central Valley Flood Protection Board (CVFPB), United States Army Corps of Engineers (USACE), Federal Emergency Management Agency (FEMA), and Reclamation. The CVFPP is a guidance document that proposed a State system-wide investment approach for improving integrated flood management and flood risk-reduction for areas protected by State Plan of Flood Control (SPFC) facilities along the Sacramento River and San Joaquin River systems. The SPFC represents the portion of the Central Valley flood management system for which the State has provided assurances of non-federal cooperation to the United States. SPFC facilities include levees, weirs, bypass channels, pumps, and dams. The CVFPP provides general planning and guidance for flood management system improvements over the next 20–25 years. The CVFPP was adopted in 2012 by the Central Valley Flood Protection Board and will be updated every five years. The Notice of Preparation was released for the 2017 CVFPP update in April 2016 (California Department of Water Resources 2016b). The CVFPP and associated studies and plans from the contributing planning efforts mentioned after this point are all in the feasibility study and planning stages; CEQA and NEPA documents have not been completed for those plans. But, while impacts from the potential CVFPP-related projects are as yet unknown, the CVFPP planning efforts consider the other projects planned in the Yolo Bypass and are expected to be compatible with the proposed project.

The planning efforts that contribute to the 2017 CVFPP recommendations include the *Sacramento River Basin-Wide Feasibility Study*, *Lower Sacramento River/Delta North Regional Flood Management Plan*, and the *Central Valley Flood System Conservation Strategy*.

- **Sacramento River Basin-Wide Feasibility Study.** The *Sacramento River Basin-Wide Feasibility Study* (BWFS) documents the new information that provides the foundation for the 2017 CVFPP update by refining and evaluating elements broadly identified in the 2012 CVFPP. The Sacramento River BWFS evaluates options for improving the bypass system. Improvements include potential expansion of the Yolo Bypass and Fremont Weir, the Sacramento Bypass, and the Sutter Bypass (California Department of Water Resources 2016b). Expansion would be accomplished through various combinations of levee setbacks, weir expansions, and new bypass channels integrated with ecosystem restoration actions.
- **Lower Sacramento/Delta North Regional Flood Management Plan.** Following adoption of the 2012 CVFPP, DWR launched a regional effort to help local agencies describe local flood management priorities, challenges, and potential funding mechanisms. The *Lower Sacramento/Delta North Regional Flood Management Plan* (RFMP) was developed by FloodProtect, a regional working group that includes counties, cities, flood management agencies, local maintaining agencies, water agencies, emergency response agencies, citizen groups, and tribes. RFMP planning is integrated with BWFS planning so that recommended regional improvements are considered in BWFS preparation. The Lower Sacramento/Delta North RFMP established the flood management vision for the region and identified regional solutions to flood management problems at a pre-feasibility level, including improvements to existing flood management facilities (FloodProtect 2014). The Yolo Bypass is a focus area of the Lower Sacramento/Delta North RFMP.
- **Central Valley Flood System Conservation Strategy.** The *Central Valley Flood System Conservation Strategy* (Conservation Strategy) is integral to implementing the 2012 CVFPP State Systemwide Investment Approach. The Conservation Strategy focuses on the integration and improvement of ecosystem functions with flood risk reduction projects and identifies specific tools and approaches to restore natural areas to benefit fish and wildlife (California Department of Water Resources 2015).
- **Lower Elkhorn Basin Levee Setback Project.** The Lower Elkhorn Basin Levee Setback Project is the first phase of implementation of recommendations from the 2012 CVFPP and associated studies carried out by DWR. The project would contribute to the CVFPP goals of providing improved public safety for approximately 780,000 people by reducing river levels (stages) in the Sacramento River and increasing the capacity of the Yolo and Sacramento bypasses near the urban communities of Sacramento and West Sacramento, as well as Woodland, Clarksburg, and rural communities. The improvements would also provide system resiliency and opportunities to improve ecosystem functions, such as increasing inundated floodplain habitat for fish rearing and improving the connection to the Sacramento Bypass Wildlife Area. The project consists of approximately 7 miles of setback levees in the Lower Elkhorn Basin along the east side of the Yolo Bypass, and the north side of the Sacramento Bypass. The project would remove all or portions of the existing levees that would be set back, remove portions of local reclamation district cross levees, and improve or relocate related infrastructure. DWR is coordinating closely with the USACE and the CVFPB to obtain



necessary permits to carry out this project. DWR is also coordinating with local reclamation districts and land-use agencies on specific infrastructure relocation and improvements. Construction of the selected alternative is expected to begin in 2020. The Lower Elkhorn Basin Levee Setback Project is not expected to conflict with the fish passage improvements of the proposed project.

- **Sacramento River Bank Protection Project.** The Sacramento River Bank Protection Project (SRBPP) was authorized by Section 203 of the Flood Control Act of 1960. The SRBPP is designed to enhance public safety and help protect property along the Sacramento River and its tributaries by protecting existing levee and flood control facilities of the Sacramento River Flood Control Project. The USACE, Sacramento District, is responsible for implementation of the SRBPP in coordination with its non-federal partner, the Central Valley Flood Protection Board. The SRBPP was originally authorized to rehabilitate 430,000 linear feet of bank protection (Phase I). In 1974, the Water Resources Development Act (WRDA) authorized an additional 405,000 linear feet (Phase II). In 2007, WRDA gave supplemental authorization for an additional 80,000 linear feet under Phase II. A draft post authorization change report and draft programmatic environmental impact statement/environmental impact report (EIS/EIR) have been prepared for the supplemental authorization (United States Army Corps of Engineers 2016a). Actions under the supplemental authorization may include bank protection in the form of rock revetment, biotechnical bank stabilization, setback levees, or construction of adjacent levees. Identified protection sites include a portion of the northern Yolo Bypass. There are no SRBPP projects currently under construction immediately adjacent to, or upstream of, the proposed project. Additional project-level environmental documentation will be prepared in the future to address specific project sites under this program (ICF International 2014).
- **Environmental Permitting for Operations and Maintenance Project.** DWR is mandated to maintain and operate certain levees, channels, and on appurtenant structures of the Sacramento River Flood Control Project (SRFCP) along the Sacramento River and tributaries, and part of the Middle Creek Project in Lake County, on behalf of the State of California pursuant to California Water Code Sections 8361 and 12878 et seq., and in accordance with federal requirements. The SRFCP levees, channels, and structures are located along the Sacramento River and its tributaries between Red Bluff and the area just south of Rio Vista, and a portion of the Middle Creek Project located near Clear Lake in Lake County. DWR maintenance activities include, but are not limited to: (1) levee maintenance (e.g., rodent abatement and damage repair, vegetation management, erosion repair, toe drain, levee crown and access road maintenance, unauthorized encroachment removal, stability berm reconstruction, and fencing/levee protection) to ensure serviceability in times of floods, and provide visibility and access for inspections, maintenance, and flood fighting activities; (2) channel maintenance (e.g., sediment removal, debris/obstruction, vegetation management, and channel and bank scour repair) to maintain flood conveyance capacity and structural integrity of channel and associated flood control structures; (3) flood control structure maintenance and repair (e.g., pumping plants, weirs and outfall gates, and bridge maintenance and repair, and pipe/culvert repair, replacement, and abandonment); and (4) data collection. The Environmental Permitting for Operations and Maintenance Project (EPOM) would allow the continuation of these maintenance activities within the regulatory limitations imposed by the required permits. The draft EIR was released for public review in January, 2017. The EPOM Project would not conflict with the fish passage improvements of the proposed project. EPOM would provide

long-term maintenance of the Fremont Weir Wildlife Area and would include maintenance of the proposed fish passage structure.

- **Sacramento River General Reevaluation Report.** The Sacramento River General Reevaluation Report (SRGRR) is being prepared by the USACE to reevaluate the Sacramento River Flood Control Project, which consists of levees, weirs, pumping plants, and bypass channels that help reduce the risk of flooding in the Sacramento Valley and Sacramento-San Joaquin Delta (Delta). The reevaluation focuses on ecosystem benefits in the flood system and flood system improvements within the flood conveyance system. The reevaluation also includes considerations for long-term operations and maintenance of system improvements (United States Army Corps of Engineers 2016b). Flood system improvements to be considered include widening bypasses, modifying weir operations, and constructing setback levees. Ecosystem benefits to be considered include restoration of aquatic and riparian habitat and enhanced fish passage. Flood system improvements and ecosystem benefits include considerations within the Yolo Bypass. The SRGRR is in preparation; CEQA and NEPA documents have not been completed. While impacts from potential SRGRR-related projects are as yet unknown, the SRGRR planning efforts consider the other projects planned in the Yolo Bypass and are expected to be compatible with the proposed project.
- **American River Common Features General Reevaluation Report.** The American River Common Features Project (ARCFP) was authorized by the WRDA of 1996 to increase flood protection for the city of Sacramento. The ARCFP was authorized to strengthen the north and south levees of the American River and raise and strengthen the upper 12 miles of the east levee of the Sacramento River in the Natomas area. The WRDA of 1999 expanded the scope of the ARCFP to include raising and/or strengthening additional portions of levees along the American River and the Natomas Cross Canal. The USACE completed a post-authorization change study of the ARCFP in 2015 and prepared the final *American River Watershed Common Features General Reevaluation Report* (United States Army Corps of Engineers 2015a) to indicate the results of reevaluating the ARCFP and identifying the levee improvements needed to provide at least a 200-year level of flood protection for the city of Sacramento and the Natomas area. Needed improvements include widening the Sacramento Weir and the Sacramento Bypass on the east side of the Yolo Bypass, upstream of the confluence of the American and Sacramento rivers. This would be accomplished by constructing a new Sacramento Bypass north levee set back 1,500 feet from the existing levee, removing the existing Sacramento Weir north levee, and constructing a new weir section to lengthen the existing Sacramento Weir. USACE prepared a final EIS/EIR for the General Reevaluation Report's (GRR's) project alternatives in December 2015 (United States Army Corps of Engineers 2015b). The GRR covered a substantially larger geographic area than just the Sacramento Bypass. Regardless, only a subset of the GRR's potentially significant impacts bear on the proposed project. The Sacramento Bypass Project and the proposed project are compatible, and potentially significant impacts on resources from GRR-related projects can be mitigated to less-than-significant levels. No other resource impacts would be increased to potentially significant levels by completion of either the Sacramento Bypass Project or the proposed project.
- **Lower Cache Creek Flood Risk Management Feasibility Study and the Woodland Flood Risk Reduction Project.** The Lower Cache Creek Flood Risk Management Feasibility Study will evaluate a combination of one or more flood control measures, including a setback levee along Cache Creek, stream channel improvements, a north Woodland floodway, and a northern

bypass into the Colusa Drain (United States Army Corps of Engineers 2015c). The USACE, DWR, and the City of Woodland are preparing a draft feasibility report and draft EIS/EIR to evaluate impacts associated with this proposed flood-risk reduction project. In addition, the City of Woodland is partnering with DWR through its Urban Flood Risk Reduction program to identify and implement a State/city flood-risk reduction project that complies with the Senate Bill 5 requirement that urban communities have 200-year flood protection. The Woodland Flood Risk Reduction Project and associated environmental review are still in the planning stages. The project is planned to be compatible with alternatives currently being evaluated by USACE as part of the ongoing feasibility study, which is expected to be completed in 2017. The measures under evaluation in the Lower Cache Creek Flood Risk Management Feasibility Study are near the Yolo Bypass, but are located west of the western levee, and therefore are not expected to conflict with or affect the proposed project.

- **California WaterFix.** The *Bay Delta Conservation Plan* (BDCP) is a habitat conservation plan and natural community conservation plan proposed by DWR, Reclamation, United States Fish and Wildlife Service, and National Marine Fisheries Service (NMFS) to contribute to the recovery of listed species, restore a more naturally functioning Delta ecosystem, and provide a reliable source of fresh water from the Delta for drinking water. The BDCP included construction of new water delivery infrastructure and aquatic habitat restoration. In 2015, a new sub-alternative (Alternative 4A) replaced Alternative 4 of the proposed BDCP as the CEQA and NEPA preferred alternative. Alternative 4A, known as California WaterFix, represents a separation of the proposed conveyance facility from the habitat restoration measures that were included in the BDCP. The habitat restoration measures are now included in the California EcoRestore initiative. The proposed conveyance facility includes construction of three new intakes in the north Delta that would supply two new parallel underground pipelines. The pipelines would convey diverted water to the existing export facilities in the south Delta. Mitigation for California WaterFix is expected to include approximately 2,300 acres of habitat restoration and up to 13,300 acres of habitat protection (California Natural Resources Agency 2016a). Restoration and protection actions would be focused mainly in the Delta, but could also result in restoration of portions of the Yolo Bypass. The final environmental impact report/ environmental impact statement for California WaterFix was released on December 22, 2016. California WaterFix and California EcoRestore were originally developed as one effort and are compatible with each other. Together they would address water supply reliability needs and the need for ecosystem improvements. The proposed project is included in the California EcoRestore initiative and would be compatible with California WaterFix.
- **California EcoRestore.** California EcoRestore is an initiative that will attempt more than 30,000 acres of critical Delta restoration pursuant to the National Marine Fisheries Service's 2009 Biological Opinion and Conference Opinion on the Long-term Operations of the Central Valley Project and the State Water Project (2009 NMFS BO) and the 2008 U.S. Fish and Wildlife Service Biological Opinion for Delta Smelt. The 2009 NMFS BO included a Reasonable and Prudent Alternative (RPA) with recommended changes to allow continued operation of the CVP and SWP without putting in jeopardy or causing adverse modification to the critical habitats of Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, and the Southern Distinct Population Segment (Southern DPS) of North American green sturgeon. A broad range of projects are included in the California EcoRestore initiative to accomplish enhancements and improvements to the

overall health of the Delta, including projects within or adjacent to the Yolo Bypass (California Natural Resources Agency 2016b).

- The Knights Landing Outfall Gates Project — construction of a positive fish barrier on the downstream side of the existing Knights Landing Outfall Gates structure to prevent adult salmon entry into the Colusa Basin Drain.
- Wallace Weir Fish Rescue Project — construction of a permanent Wallace Weir fish rescue facility to prevent fish from straying into the Colusa Basin Drain.
- Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project — construction of a gated, deep notch through Fremont Weir to provide the primary means for adult fish passage and create additional floodplain habitat in the Yolo Bypass, and modification of the northernmost agricultural road crossing (Agricultural Road Crossing 1) in Tule Canal to improve hydraulic connectivity.
- Lower Putah Creek Restoration Project — creation of a new creek channel to improve fish passage and native fish habitat and connect Putah Creek with previously restored tidal channels.
- Lisbon Weir Fish Passage Project — replacement of Lisbon Weir to provide more reliable fish passage in the southern Yolo Bypass.
- A future project that would include modification of the southernmost agricultural road crossing (Agricultural Road Crossing 4) in the Tule Canal to improve adult fish passage.
- These California EcoRestore projects are in various stages of development, from conceptual to completed. The proposed project is also included in the California EcoRestore Initiative and is, by design, compatible with other projects that are still in the planning stages. The proposed project would add to the ecosystem benefits that would occur with implementation of the other proposed California EcoRestore projects, as implementation of the suite of restoration actions included in these California EcoRestore projects would achieve full compliance with the RPA I.7.
- **Yolo Habitat Conservation Plan/Natural Communities Conservation Plan and the Yolo Local Conservation Plan.** The *Yolo Habitat Conservation Plan/Natural Communities Conservation Plan* (HCP/NCCP) and *Yolo Local Conservation Plan* were formerly known as the Yolo Natural Heritage Program. The Yolo HCP/NCCP covers 12 endangered and threatened species and 15 natural communities, enabling agencies to construct projects and implement activities that affect the habitat of the covered species, and establishes a framework to protect, enhance, and restore natural resources within Yolo County. The Yolo Local Conservation Plan expands on the Yolo HCP/NCCP to cover species and natural communities of local concern not included in the Yolo HCP/NCCP (Yolo Habitat Conservancy 2016). Covered activities include ongoing operation and maintenance of existing flood control facilities and implementation of habitat enhancement, restoration, and creation actions included in the Yolo HCP/NCCP Conservation Strategy. Administrative drafts of both plans are in preparation. Although these plans are in draft form and have not yet been implemented, the proposed project would be compatible with them.
- **North Bay Aqueduct Alternate Intake Project.** DWR proposes to implement the North Bay Aqueduct Alternate Intake Project (NBA AIP) to improve water quality, flexibility, and reliability of State Water Project deliveries to its NBA contractors, the Solano County Water Agency, and the Napa County Flood Control and Water Conservation District. The NBA AIP proposes construction and operation of a new intake and pumping plant on the Sacramento River, conveyance pipeline, and inline storage to divert and convey water from the Sacramento

River to the existing NBA pipeline near the North Bay Regional Water Treatment Plant in Fairfield. In addition to improving the water quality and increasing water supply reliability of deliveries to NBA contractors, the NBA AIP would provide operational flexibility to reduce effects on listed species, critical habitat in Barker Slough, and limit effects on listed species at the location of the proposed alternate intake. The NBA AIP would be located predominantly in rural portions of Solano and Yolo counties southeast of Interstate 80, west of the Sacramento River, north of Barker Slough, and south of the City of West Sacramento. DWR has prepared a draft EIR that has not yet been circulated for public review. Some construction activities associated with the NBA AIP would occur in the Yolo Bypass Wildlife Area when the bypass is not flooded. Although there would be temporary environmental impacts associated with the NBA AIP, construction would occur south of the proposed project area and would not occur at the same time as the proposed project. Therefore, the NBA AIP is not expected to conflict with or affect the proposed project.

- **Delta Plan.** The 2009 Delta Reform Act established the Delta Stewardship Council and required development of a legally enforceable, comprehensive, long-term management plan for the Delta and Suisun Marsh. The Delta Plan, released in 2013, is a legally enforceable, comprehensive, long-term management plan that creates new rules and recommendations to achieve the State's coequal goals to:

- Provide a more reliable water supply for California.
- Protect, restore, and enhance the Delta ecosystem.

The Delta Plan recommendations further the State's coequal goals while preserving, protecting, and enhancing the unique agricultural, cultural, and recreational characteristics of the Delta. The Delta Plan includes a science-based, formal adaptive management strategy for ongoing ecosystem restoration and water management decisions. State and local agency-covered actions are required to be consistent with the Delta Plan. Covered actions are plans, programs, or projects that occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh; are carried out, approved, or funded by the State or a local public agency; are covered by one or more provisions of the Delta Plan; and will have a significant impact on the achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and State interests in the Delta (Delta Stewardship Council 2013). Although the proposed project is outside of the Delta Plan-covered area, the proposed project actions are consistent with the Delta Plan.

The proposed project is intended to alleviate the incremental impacts of past actions by providing enhanced fish passage opportunities for federally listed and State-listed salmonids and green sturgeon during and immediately following a Fremont Weir overtopping event, reducing the reliance on fish rescue in the FWWA, and improving fish passage in the Tule Canal. The proposed project would be compatible with the present and reasonably foreseeable actions described above, as many of these actions already take the proposed project into consideration or would be constructed in areas that are not immediately adjacent to, or upstream of, the proposed project.

As described in section 3.16, "Mandatory Findings of Significance," construction of the proposed project would result in potentially adverse effects on air quality, biological resources, cultural resources, geology, hazards and hazardous materials, water quality, noise, recreation, and tribal cultural resources, but would not result in significant impacts. Each of the potential impacts would be reduced to less-than-significant levels with implementation of avoidance and minimization measures and by incorporating mitigation

measures (refer to Appendix C, “Mitigation Monitoring and Reporting Program”). If construction of one or more of the actions described above were to occur during the same time frame as the proposed project and in the vicinity of the proposed project, the level of significance of impacts on these resources could increase. That said, many of the actions described above are in the planning and feasibility study stage and would not be constructed concurrently. It is possible that the ARCFP could be constructed during the same time frame, but the ARCFP covers a large geographic area and could be constructed in phases to avoid Sacramento Bypass construction concurrent with proposed project construction. If constructed concurrently, both projects would coordinate to mitigate temporary cumulative effects to less-than-significant levels, and in the long term would provide a net benefit to fish. Therefore, the incremental effect of proposed project construction would not be cumulatively considerable.

No potentially adverse impacts from operation or maintenance of the proposed project were identified. During operation of the proposed project, approximately 1,100 cubic feet per second would flow through the Fremont Weir fish passage structure during high-flow events on the Sacramento River. These increased flows would occur just prior to a Fremont Weir overtopping event, which occurs when the Sacramento River reaches flood stage. Initial hydrologic and hydraulic modeling conducted by DWR (Appendix F and Appendix G) showed that there would be no significant change in water surface elevations in the Yolo Bypass and the adjacent Sacramento River under the 1957-design flood conditions and no change in velocity at maximum flood stage because of implementation of the proposed project. These negligible changes in hydrology would not be cumulatively considerable.

Many of the actions described above would improve flood management along the Sacramento River by setting back levees, widening bypasses, or modifying weirs, and would result in increased diversions from the Sacramento River. Even so, the incremental effect of each action, including the proposed project, would not be cumulatively considerable because project operations would occur when the Sacramento River reaches flood stage and thus would not infringe on the water rights of downstream users.

## 5.0 Consultation and Coordination

This chapter summarizes the consultation and coordination activities undertaken by DWR and Reclamation, to date, for the proposed project.

### 5.1 Tribes, Agencies, and Organizations Contacted or Consulted

The California State Historic Preservation Officer is being consulted in accordance with Section 106 of the National Historic Preservation Act. DWR and Reclamation sent consultation letters to four Native American tribes (Wilton Rancheria, United Auburn Indian Community of the Auburn Rancheria of California, the Yocha Dehe Wintun Nation, and the Ione Band of Miwok Indians of California) in accordance with Assembly Bill 52 and Section 106 of the National Historic Preservation Act. Reclamation also sent a consultation letter to the Cortina Band of Indians. Additionally, DWR consulted with the Yocha Dehe Wintun Nation about all proposed DWR projects in the Yolo Bypass. Both the United Auburn Indian Community and Yocha Dehe Wintun Nation responded to the DWR letter and accepted the invitation to consult.

During planning and design of the proposed project, numerous meetings were held in coordination with the California Department of Fish and Wildlife (CDFW), the National Marine Fisheries Service (NMFS), the United States Fish and Wildlife Service (USFWS), the Central Valley Flood Protection Board (CVFPB), Yolo County, and the United States Army Corps of Engineers (USACE). These agencies were also contacted during the development of this document. Additionally, NMFS and USFWS are being consulted in accordance with Section 7 of the Endangered Species Act, and CDFW is being consulted in accordance with the California Endangered Species Act, regarding the proposed project.

### 5.2 Landowners and Stakeholders Consulted

Throughout planning and design of the proposed project, landowners and/or representatives of the properties that would be directly affected by project construction were consulted. Josh Bush, CDFW's Fremont Weir Wildlife Area (FWWA) land manager, was consulted to minimize conflicts between construction activities and recreation activities within the FWWA. John Brennan and Dominic Bruno, representing TeVelde Properties, were consulted regarding the proposed modifications of Agricultural Road Crossings 2 and 3.

DWR and Reclamation also met with the Yolo Bypass Working Group on multiple occasions to discuss this effort and the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project. The Yolo Bypass Working Group includes representatives of local government, nongovernmental organizations, water agencies, and flood managers.

### 5.3 Public Comments

The draft IS/EA is being circulated to federal, State, and local agencies, as well as interested organizations and individuals, who may wish to review the document and provide written comments. This document is available for a 30-day public review period. Written comments or questions on the document can be addressed to either of the following agency leads:

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The draft document will be sent to the State Clearinghouse and will be available online on the DWR and Reclamation websites, respectively:

[http://www.water.ca.gov/environmentalservices/yolobypass/projects/yolo\\_fremont.cfm](http://www.water.ca.gov/environmentalservices/yolobypass/projects/yolo_fremont.cfm),

[https://www.usbr.gov/mp/nepa/nepa\\_projdetails.cfm?Project\\_ID=12670](https://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=12670), and

<https://www.usbr.gov/mp/BayDeltaOffice/yolo-bypass.html>.

A printed copy of the draft IS/EA will also be available from Karen Enstrom or Ben Nelson at their respective offices.

## 5.4 Regulatory Compliance

The proposed project would comply with the environmental laws and regulations described in the individual resource sections in Chapter 3, “Environmental Setting, Discussion of Impacts, and Mitigation Measures.” DWR and Reclamation, in coordination with the appropriate approving agency, would obtain the required permits and approvals for the proposed project prior to project implementation (Table 5-1).

**Table 5-1 Permits and Approvals that May Be Required for the Fremont Weir Adult Fish Passage Modification Project**

Approving Agency	Required Permit/Approval	Required For
<i>Federal Agencies</i>		
U.S. Bureau of Reclamation	Project Approval/NEPA Compliance	Funding and project implementation
U.S. Army Corps of Engineers	Federal Clean Water Act Section 404 Permit	Discharge of dredged or fill material into water of the United States, including wetlands
	Federal Rivers and Harbors Act Section 10 Permit	Construction of any structure in or over any navigable water of the United States
	Federal Rivers and Harbors Act Section 14 (33 USC 408) Permit	Modifications to USACE projects designed to protect river banks
National Marine Fisheries Service	Magnuson-Stevens Fishery Conservation and Management Act Compliance	Potential impacts on Essential Fish Habitat of species covered by the act
	Federal Endangered Species Act Section 7 Consultation	Potential impacts on federally listed fish species or critical habitat
U.S. Fish and Wildlife Service	Federal Endangered Species Act Section 7 Consultation	Potential impacts on federally listed species or critical habitat
	Migratory Bird Treaty Act Compliance	Potential impacts on migratory birds
<i>State Agencies</i>		
California Department of Water Resources	Project Approval/ CEQA Compliance	Funding and project implementation



Approving Agency	Required Permit/Approval	Required For
Central Valley Flood Protection Board	Encroachment Permit (CCR Title 23)	Activities that may affect a regulated floodway
California Department of Fish and Wildlife	California Endangered Species Act Consultation (Section 2081)	Incidental take or otherwise lawful activities that may adversely affect State-listed species
	Lake and Streambed Alteration Agreement (Section 1602 of the California Fish and Game Code)	Any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake
California Office of Historic Preservation	National Historic Preservation Act Section 106 Authorization	Any actions that may have an adverse impact on historical resources
State Water Resources Control Board or Central Valley Regional Water Quality Control Board	Clean Water Act Section 401 Certification	Discharge of pollutants into navigable waters or their tributaries
	Federal Clean Water Act Section 402 General Construction Activity Stormwater Permit	Stormwater discharges to navigable waters associated with construction activity for greater than 1 acre of land disturbance
<i>Regional and Local Agencies</i>		
Yolo County	Transportation Permit	Overweight or oversized loads transported on any county-maintained road
	Grading Permit	Work performing clearing, grading, importing or exporting of earth material
	Flood Hazard Development Permit	For any construction or other development within any area of special flood hazards (as defined by Yolo County Flood Insurance Rate Maps)

Notes: CCR = California Code of Regulations, CEQA = California Environmental Quality Act, NEPA = National Environmental Policy Act, USACE = United States Army Corps of Engineers, USC = United States Code



## 6.0 List of Preparers and Contributors

The following is a list of individuals who authored chapters or sections of this IS/EA, provided significant technical advice in their area of expertise, prepared field survey data reports, provided project description engineering details, and/or participated in internal editing and review of this document.

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## 6.3 CDM Smith

<b>Name</b>	<b>Title</b>	<b>Project Role</b>
Carrie Buckman	Water Resources Engineer	<b>Document Review Technical Advisor</b> – Consultation and Coordination
Gwen Pelletier	Principal Environmental Scientist	<b>Technical Advisor</b> – Air Quality

## 6.4 Far Western Anthropological Research Group

<b>Name</b>	<b>Title</b>	<b>Project Role</b>
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## 7.0 References

### 1.0 Introduction

California Data Exchange Center. 2016. *Department of Water Resources California Data Exchange Center – October 2016 Datum Change Information*. [Web site.] Viewed online at: [http://cdec.water.ca.gov/misc/datum\\_change2016.html](http://cdec.water.ca.gov/misc/datum_change2016.html).

California Department of Fish and Game. 2011. *Isolated Sturgeon Rescue at Fremont and Tisdale Weirs*. [Memorandum.] Rancho Cordova (CA).

California Department of Fish and Wildlife. 2016. *Summary of Fish Rescues Conducted within the Yolo and Sutter Bypasses*. North Central Region. Prepared for the United States Bureau of Reclamation. July.

California Natural Resources Agency. 2015. *California EcoRestore — A Stronger Delta Ecosystem*. State of California. [Website.] Viewed online at: <http://resources.ca.gov/ecorestore/>. Accessed: December 2015.

National Marine Fisheries Service. 2009. *Biological Opinion and Conference Opinion on the Long-term Operations of the Central Valley Project and the State Water Project*. Southwest Region. Long Beach (CA).

### 2.0 Description of the Proposed Project and No-Action Alternative

California Department of Water Resources. 2016. *Adult Fish Passage Criteria for Federally Listed Species within the Yolo Bypass and Sacramento River*. Technical memorandum for the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project. Sacramento (CA).

### 3.1 Resources Eliminated from Further Analysis

County of Yolo. 2009. 2030 Countywide General Plan. County of Yolo, Planning and Public Works Department. Viewed online at: <http://www.yolocounty.org/general-government/general-government-departments/county-administrator/general-plan-update/adopted-general-plan>. Accessed: April 2016. Pages Cited: CI-3, CO-44, LU-8, PF-17, PF-21.

Yolo County Habitat Conservation Plan/Natural Community Conservation Plan Joint Powers Agency. 2015. Yolo Habitat Conservation Plan and Natural Community Conservation Plan. Second Administrative Draft. Viewed online at: <http://www.yolohabitatconservancy.org/#!documents/csyl>. Accessed: April 2016.

### 3.2 Aesthetics

County of Yolo. 2009. 2030 Countywide General Plan. County of Yolo, Planning and Public Works Department. Viewed online at: <http://www.yolocounty.org/general-government/general-government-departments/county-administrator/general-plan-update/adopted-general-plan>. Accessed: April 2016. Pages Cited: CO-6, LU-30.

National Wild and Scenic Rivers System. 2016. California. [Web page.] Viewed online at: <https://www.rivers.gov/california.php>. Accessed: April 2016.

### 3.3 Agricultural and Forest Resources

County of Yolo. 2009. *2030 Countywide General Plan*, Agriculture and Economic Development Element. County of Yolo, Planning and Public Works Department. Viewed online at: <http://www.yolocounty.org/home/showdocument?id=14465>. Accessed: April 21, 2016.

County of Yolo 2014. 2014. Map 2, Adopted Zoning — July 2014. County of Yolo, Planning and Public Works Department. Viewed online at: <http://www.yolocounty.org/home/showdocument?id=31380>. Accessed: April 21, 2016.

California Department of Conservation. 2012. Yolo County Williamson Act FY 2010/2011. California Department of Conservation, Division of Land Resource Protection. Viewed online at: [ftp://ftp.consrv.ca.gov/pub/dlrp/wa/yolo\\_10\\_11\\_WA.pdf](ftp://ftp.consrv.ca.gov/pub/dlrp/wa/yolo_10_11_WA.pdf). Accessed: April 21, 2016.

———. 2015. Yolo County Important Farmland 2014. California Department of Conservation, Division of Land Resource Protection. Viewed online at: <ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2014/yol14.pdf>. Accessed: April 21, 2016.

### 3.4 Air Quality

California Air Resources Board. 2016a. Ambient Air Quality Standards. California Air Resources Board. Sacramento (CA): CARB. [Website]. Viewed online at: <http://www.arb.ca.gov/research/aaqs/aaqs2.pdf>. Accessed: April 11, 2016. Last updated: May 4, 2016.

———. 2016b. Area Designations for State Ambient Air Quality Standards. California Air Resources Board. Sacramento (CA): CARB. [Website]. Viewed online at: <http://www.arb.ca.gov/desig/adm/adm.htm>. Accessed: July 27, 2016. Last updated: December 2015.

———. 2016c. *Proposed 2016 State Strategy for the State Implementation Plan*. California Air Resources Board. Sacramento (CA): CARB. 118pp. [Report]. Viewed online at: <http://www.arb.ca.gov/planning/sip/2016sip/2016statesip.pdf>. Accessed: July 26, 2016. Last updated: May 17, 2016.

ENVIRON International Corporation and the California Air Districts. 2013. California Emissions Estimator Model. Version 2013.2. Prepared by: ENVIRON International Corporation, South Coast Air Quality Management District, and California air districts. Prepared for: California Air Pollution Control Officers Association. [Software.] Viewed online at: <http://www.caleemod.com/>. Accessed: 5/5/2016.

Sacramento Valley Air Quality Engineering and Enforcement Professionals. 2015. *Northern Sacramento Valley Planning Area 2015 Triennial Air Quality Attainment Plan*. 40pp.



- United States Environmental Protection Agency. 2016a. Criteria Air Pollutants. [Web page.] Viewed online at: <https://www.epa.gov/criteria-air-pollutants>. Accessed: June 3, 2016.
- . 2016b. Green Book Nonattainment Areas. U.S. EPA. Research Triangle Park (NC): U.S. EPA. [Website.] Viewed online at: [https://www3.epa.gov/airquality/greenbook/phistory\\_ca.html](https://www3.epa.gov/airquality/greenbook/phistory_ca.html). Accessed: July 27, 2016. Last updated: June 17, 2016.
- . 2016c. De Minimis Emission Levels. [Web page.] Viewed online at: <https://www.epa.gov/general-conformity/de-minimis-emission-levels>. Accessed: October 25, 2016.
- Yolo-Solano Air Quality Management District. 2007. *Handbook for Assessing and Mitigating Air Quality Impacts*. Davis (CA): YSAQMD. 54pp. [Book]. Viewed online at: <http://www.ysaqmd.org/documents/CEQAHandbook2007.pdf>. Accessed: May 3, 2016. Pages cited: 1–54.
- . 2016. *Draft Triennial Assessment and Plan Update*. Davis (CA): YSAQMD. 50pp. [Report]. Viewed online at: <http://www.ysaqmd.org/planning/triennial-plan-2016-draft.pdf>. Accessed: July 26, 2016. Last updated: March 11, 2016.

### 3.5 Biological Resources

- Beamish RJ. 1980. Adult Biology of the River Lamprey (*Lampetra ayresi*) and the Pacific Lamprey (*Lampetra tridentata*) from the Pacific Coast of Canada. *Can. J. Fish. Aquat. Sci.* 37:1906–1923.
- Bergman P, J Merz, and B Rook. 2011. *Green Sturgeon Observations at Daguerre Point Dam, Yuba River, CA*. Cramer Fish Sciences Technical Memorandum prepared for the Anadromous Fish Restoration Program. Auburn (CA). June.
- Brostrom JK, CW Luzier, and K Thompson. 2010. *Best Management Practices to Minimize Adverse Effects to Pacific Lamprey (Entosphenus tridentata)*. U.S. Fish and Wildlife Service. April.
- Buck-Diaz J, S Batiuk, and JM Evens. 2012. *Vegetation Alliances and Associations of the Great Valley Ecoregion, California*. Volume 1. Sacramento (CA): California Native Plant Society. 485 pp.
- California Department of Fish and Wildlife. 2013. *Fine-Scale Riparian Vegetation Mapping of the Central Valley Flood Protection Plan Area Final Report*. Volume 1. California. 51pp. Prepared for California Department of Water Resources Central Valley Flood Protection Program, by California Department of Fish and Wildlife's Vegetation Classification and Mapping Program and Geographical Information Center, California State University Chico. GIS data viewed online at: <https://www.dfg.ca.gov/biogeodata/gis/veg.asp>. Accessed: April 20, 2016.
- . 2016a. California Natural Diversity Database. RareFind 5 (online edition, 5). Sacramento (CA): California Department of Fish and Wildlife. [Online database]. Viewed online at: <https://map.dfg.ca.gov/rarefind>. Accessed: April 12, 2016. Last updated: April 5, 2016.

- . 2016b. CWHR Life History Accounts and Range Maps. Viewed online at: <https://www.dfg.ca.gov/biogeodata/cwhr/cawildlife.aspx>. Accessed: June 1, 2016.
  - . 2016c. *Summary of Fish Rescues Conducted within the Yolo and Sutter Bypasses*. North Central Region. Prepared for the United States Bureau of Reclamation. July.
- California Department of Water Resources. 2014a. *Yolo Bypass Habitat Restoration 2014 Botanical Survey Report*. Sacramento (CA).
- . 2014b. *Yolo Bypass Habitat Restoration 2014 Giant Garter Snake and Western Pond Turtle Survey Report*. Sacramento (CA).
  - . 2014c. *Yolo Bypass Habitat Restoration 2014 Mammal Survey Report*. Sacramento (CA).
  - . 2015a. *Yolo Bypass Habitat Restoration 2015 Botanical Survey Report*. Sacramento (CA).
  - . 2015b. *Yolo Bypass Habitat Restoration 2015 Giant Garter Snake and Western Pond Turtle Survey Report*. Sacramento (CA).
  - . 2015c. *Yolo Bypass Habitat Restoration 2015 Mammal Survey Report*. Sacramento (CA).
  - . 2015d. *Yolo Bypass Habitat Restoration 2015 Avian Survey Report*. Sacramento (CA).
  - . 2016a. *Yolo Bypass Fish Monitoring Database (internal query)*. West Sacramento, CA. [database]. Accessed: July 15, 2016.
  - . 2016b. *Delineation of Aquatic Resources and Preliminary Jurisdictional Determination*. Fremont Weir Adult Fish Passage Modification Project. September 30. 107 pp.
  - . 2016c. *Addendum to the Delineation of Aquatic Resources and Preliminary Jurisdictional Determination*. Fremont Weir Adult Fish Passage Modification Project. December 2. 8 pp.
- California Native Plant Society. 2016. *Inventory of Rare and Endangered Plants (online edition, v8-02)*. Sacramento (CA): California Native Plant Society. [Online database.] Rare Plant Program. Viewed online at: <http://www.rareplants.cnps.org>. Accessed: April 12, 2016.
- County of Yolo. 2009. *2030 Countywide General Plan, Conservation and Open Space Element*. County of Yolo, Planning and Public Works Department. Viewed online at: <http://www.yolocounty.org/home/showdocument?id=14464>. Accessed: April 2016.
- eBird. 2016. eBird: Explore Data (Map). [Website.] Online checklist program/database. Viewed online at: <http://ebird.org/ebird/map/>. Accessed: August 26 and December 21, 2016.
- Feyrer F, TR Sommer , RD Baxter, and CM Taylor. 2005. *Spatial-Temporal Distribution and Habitat Associations of Age-0 Splittail in the Lower San Francisco Estuary Watersheds*. Copeia. 2005(1):159–168.

- Fisheries Hydroacoustic Working Group. 2008. Agreement in principal for interim criteria for injury to fish from pile driving activities. Memorandum dated June 12, 2008. Available online at: [http://www.dot.ca.gov/hq/env/bio/files/fhwgcriteria\\_agree.pdf](http://www.dot.ca.gov/hq/env/bio/files/fhwgcriteria_agree.pdf).
- Hastings MC. 2010. Recommendations for Interim Criteria for Vibratory Pile Driving. Submitted to ICF Jones and Stokes. [Unpublished report.] June 30.
- HDR. 2014. *Fremont Weir Survey Area Vegetation Assessment*. Yolo Bypass Seasonal Floodplain Habitat Restoration and Fish Passage Improvements Project. Technical memo prepared for the California Department of Water Resources. 5 pp.
- Heublein JC, JT Kelly CE Crocker, AP Klimley, and ST Lindley. 2009. Migration of Green Sturgeon, *Acipenser medirostris*, in the Sacramento River. *Environmental Biology of Fishes*. 84(3):245–258.
- Mayer K, and W Laudenslayer, Jr., eds. 1988. *A Guide to Wildlife Habitats in California*. California Department of Fish and Game. 166 pp.
- Meng L, and PB Moyle. 1995. Status of Splittail in the Sacramento-San Joaquin Estuary. *Trans. Am. Fish. Soc.* 124:538–549.
- Moyle PB. 2002. *Inland Fishes of California*. Revised edition. Berkeley (CA): University of California Press.
- Myers JM, RG Kope, GJ Bryant, D Teel, and LJ Liehr. 1998. *Status Review of Chinook Salmon from Washington, Idaho, Oregon, and California*. (NOAA Technical Memorandum NMFS-NWFSC-35.) Seattle, WA: National Marine Fisheries Service, Northwest Fisheries Science Center.
- National Marine Fisheries Service. 1997. *Fish Screening Criteria for Anadromous Salmonids*. NMFS Southwest Region. January.
- . 2005. Green Sturgeon (*Acipenser medirostris*) Status Review Update. Biological Review Team, Santa Cruz Laboratory, Southwest Fisheries Science Center, California. February. 31 pp.
- Popper AN, and MC Hastings. 2009. The Effects of Human-Generated Sound on Fish. *Integrative Zoology* 4:43-52.
- Shapovalov L, and AC Taft. 1954. The Life Histories of the Steelhead Rainbow Trout (*Salmo gairdneri gairdneri*) and Silver Salmon (*Oncorhynchus kisutch*). *CDFG Fish Bull.* 98:1-275.
- Shuford WD, and T Gardali, eds. 2008. *California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California*. Studies of Western Birds 1. Western Field Ornithologists, Camarillo (CA), and California Department of Fish and Game, Sacramento.

- Sommer TR, R Baxter, and B Herbold. 1997. Resilience of Splittail in the Sacramento-San Joaquin Estuary. *Trans. Am. Fish. Soc.* 126:961–976.
- Sommer TR, ML Nobriga, WC Harrell, W Batham, and WJ Kimmerer. 2001. Floodplain Rearing of Juvenile Chinook Salmon: Evidence of Enhanced Growth and Survival. *Can. J. Fish. Aquat. Sci.* 58:325–333.
- United States Fish and Wildlife Service. 1999. Conservation Guidelines for the Valley Elderberry Longhorn Beetle. Sacramento (CA): U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office. 15 pp. Viewed online at: [http://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/velb\\_conservation.pdf](http://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/velb_conservation.pdf). Accessed: May 2, 2016. Pages cited: 1–15.
- . 2006. Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*) 5-Year Review: Summary and Evaluation. September.
- . 2016. Information, Planning, and Conservation System (IPaC). (Online edition, v.3.0.2). Sacramento (CA): U.S. Fish and Wildlife Service. [Online database]. Viewed online at: <https://ecos.fws.gov/ipac/>. Accessed: April 13, 2016. Yolo County HCP/NCCP Joint Powers Authority. 2015. *Second Administrative Draft Yolo Habitat Conservation Plan and Natural Community Conservation Plan*. Chapter 3, “Covered Activities.” Pages cited: 14–17.
- Yolo County Habitat Conservation Plan/Natural Community Conservation Plan Joint Powers Agency. 2015. Yolo Habitat Conservation Plan and Natural Community Conservation Plan. Second Administrative Draft. Viewed online at: <http://www.yolohabitatconservancy.org/#!documents/csyl>. Accessed: April 2016.
- Yolo Habitat Conservancy. 2016. Yolo Habitat Conservancy (“About” page). (Web page.) Viewed online at: <http://www.yolohabitatconservancy.org/about>. Accessed: June 14, 2016.
- Yoshiyama RM, FW Fisher, and PB Moyle. 1998. Historical Abundance and Decline of Chinook Salmon in the Central Valley Region of California. *N. Am. J. Fish. Mgmt.* 18:487–521.

## Personal Communication

- Tsao D. Senior Environmental Scientist (Specialist), Division of Environmental Services, California Department of Water Resources, West Sacramento (CA). Aug. 31, 2016 — meeting and e-mail correspondence with Olin E., Environmental Scientist, Division of Environmental Services, California Department of Water Resources, West Sacramento (CA).

## 3.6 Cultural Resources

- California Department of Parks and Recreation. 1976. *California Inventory of Historic Resources*. California Department of Parks and Recreation, Sacramento. On file, California Historical Resources Information System, Northwest Information Center (NWIC), Rohnert Park, California.

- . 1992. *California Points of Historical Interest*, Annual Listing and Updates through 2012. California Department of Parks and Recreation, Sacramento. On file, California Historical Resources Information System, Northwest Information Center (NWIC), Rohnert Park, California.
  - . 1996. *California Historical Landmarks*, Annual Listing and Updates through 2012. California Department of Parks and Recreation, Sacramento. On file, California Historical Resources Information System, Northwest Information Center (NWIC), Rohnert Park, California.
  - . 2012a. Directory of Properties in the Historic Property File and the Archaeological Determinations of Eligibility for Yolo County, Annual Listings and Updates through 2012. California Department of Parks and Recreation, Sacramento. On file, California Historical Resources Information System, Northwest Information Center (NWIC), Rohnert Park, California.
  - . 2012b. *California Register of Historical Resources*, Annual Listing and Updates through 2012. California Department of Parks and Recreation, Sacramento. On file, California Historical Resources Information System, Northwest Information Center (NWIC), Rohnert Park, California.
- Gutierrez, CI. 2011. Preliminary Geologic map of the Sacramento 30' x 60' quadrangle, California: California Geological Survey, Preliminary Geologic Maps, scale 1:100,000.
- Scher, N. 1916. *Geoarchaeological Investigation for the Proposed Fish Passage Expansion at Fremont Weir, Yolo County, California*. Technical report submitted to DWR Division of Environmental Services, West Sacramento.
- United States Department of the Interior. 1988. *National Register of Historic Places*, Annual Listings and Updates through 2014. National Park Service, Washington, D. C. On file, California Historical Resources Information System, Northwest Information Center (NWIC), Rohnert Park, California.

### 3.7 Geology and Soils

- California Department of Water Resources. "Groundwater Information Center Interactive Map." Viewed online at: <https://gis.water.ca.gov/app/gicima/>. Accessed May 5, 2016.
- California Geological Survey. 2002. *California Geomorphic Provinces*. California Department of Conservation, California Geological Survey. Viewed online at: [http://www.conservation.ca.gov/cgs/information/publications/cgs\\_notes/note\\_36/Documents/note\\_36.pdf](http://www.conservation.ca.gov/cgs/information/publications/cgs_notes/note_36/Documents/note_36.pdf). Accessed: May 5, 2016.
- . 2008a. Map Sheet 48 (Revised 2008), *Earthquake Shaking Potential for California*. California Department of Conservation, California Geological Survey. Viewed online at: [http://www.conservation.ca.gov/cgs/information/publications/ms/Documents/MS48\\_revised.pdf](http://www.conservation.ca.gov/cgs/information/publications/ms/Documents/MS48_revised.pdf). Accessed: May 5, 2016.

- . 2008b. “Ground Motion Interpolator.” California Department of Conservation, California Geological Survey. Viewed online at:  
[http://www.quake.ca.gov/gmaps/PSHA/psha\\_interpolator.html](http://www.quake.ca.gov/gmaps/PSHA/psha_interpolator.html). Accessed: May 5, 2016.
  - . 2010. “2010 Fault Activity Map of California.” California Department of Conservation, California Geological Survey. Viewed online at: <http://maps.conservation.ca.gov/cgs/fam/>. Accessed: May 5, 2016.
  - . 2011. Preliminary Geologic Map of the Sacramento 30’ x 60’ Quadrangle, California. California Department of Conservation, California Geological Survey. Viewed online at:  
[ftp://ftp.consrv.ca.gov/pub/dmg/rgmp/Prelim\\_geo\\_pdf/Sacramento100k\\_preliminary\\_map.pdf](ftp://ftp.consrv.ca.gov/pub/dmg/rgmp/Prelim_geo_pdf/Sacramento100k_preliminary_map.pdf). Accessed: May 5, 2016.
  - . 2015. “CGS Information Warehouse: Regulatory Maps.” California Department of Conservation, California Geological Survey. Viewed online at:  
<http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps>. Accessed: May 5, 2016.
- California Soil Resource Laboratory. 2015. “SoilWeb Earth.” University of California, Davis. Viewed online at: <http://casoilresource.lawr.ucdavis.edu/gmap/>. Accessed: May 5, 2016.
- County of Yolo. 2009. *2030 Countywide General Plan, Health and Safety Element*. County of Yolo, Planning and Public Works Department. Viewed online at:  
<http://www.yolocounty.org/home/showdocument?id=14463>. Accessed: May 5, 2016.
- Cruden, DM. 1991. “A Simple Definition of a Landslide.” *Bulletin of the International Association of Engineering Geology*, No. 43, pp. 27-29.

### 3.8 Greenhouse Gas Emissions

- California Department of Water Resources. 2012a. *Climate Action Plan Phase 1: Greenhouse Gas Emissions Reduction Plan*. Viewed online at  
<http://www.water.ca.gov/climatechange/GGERP.cfm>. Accessed: June 7, 2016.
- . 2012b. *Initial Study for the California Department of Water Resources Draft Climate Action Plan Phase 1: Greenhouse Gas Emissions Reduction Plan*. SCH# 2012032002. Viewed online at:  
<http://www.water.ca.gov/climatechange/GGERP.cfm>. Accessed: June 7, 2016.
- . 2015. *California Climate Science and Data for Water Resources Management*. Viewed online at:  
<http://www.water.ca.gov/climatechange/>. Accessed: June 7, 2016.
- County of Yolo. 2011. *Yolo County Climate Action Plan: A Strategy for Smart Growth Implementation, Greenhouse Gas Reduction, and Adaptation to Global Climate Change*. Prepared by AECOM and ASCENT in association with Fehr & Peers Transportation Consultants and CTG. Viewed online at: <http://www.yolocounty.org/community-services/planning-public-works/planning-division/climate-action-plan>. Accessed: June 7, 2016.



- . 2016. Climate Change Initiative. [Web page.] Viewed online at: <http://www.yolocounty.org/general-government/general-government-departments/county-administrator/climate-change-initiative>. Accessed: June 7, 2016.
- County of Yolo, Planning and Public Works Department. 2009. *2030 Countywide General Plan*. Viewed online at <http://www.yolocounty.org/general-government/general-government-departments/county-administrator/general-plan-update/adopted-general-plan>. Accessed: June 7, 2016.
- Ehrhardt M, P Hensleigh, M Jones, J Antone, and D O'Brien. 2007. *Handbook for Assessing and Mitigating Air Quality Impacts*. Prepared by the Yolo Solano Air Quality Management District, Davis, CA. Viewed online at: [http://www.ysaqmd.org/CEQA\\_10.php](http://www.ysaqmd.org/CEQA_10.php). Accessed: June 7, 2016.
- Intergovernmental Panel on Climate Change. 2014. *Climate Change 2014: Synthesis Report*. Contribution of Working Groups I, II, and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, RK Pachauri and LA Meyer (eds.)]. Geneva, Switzerland 151 pp. Viewed online at: <http://www.ipcc.ch/report/ar5/syr/>. Accessed: June 7, 2016.
- Kadir T, L Mazur, C Milanes, and K Randles. 2013. *Indicators of Climate Change in California*. Prepared by Office of Environmental Health Hazard Assessment for the California Environmental Protection Agency. Viewed online at: <http://oehha.ca.gov/climate-change/document/indicators-climate-change-california-environmental-justice-impacts-report#downloads>. Accessed: June 7, 2016.
- Office of Planning and Research. 2016. CEQA and Climate Change. [Web page.] View online at: [https://www.opr.ca.gov/s\\_ceqaandclimatechange.php](https://www.opr.ca.gov/s_ceqaandclimatechange.php). Accessed: June 7, 2016.
- World Meteorological Organization. 2012. The State of Greenhouse Gases in the Atmosphere Using Global Observations through 2012. Supplementary materials to the World Meteorological Organization Greenhouse Gas bulletin No.9. Viewed online at: <https://www.wmo.int/pages/prog/arep/gaw/ghg/ghg9-en-online.html>. Accessed: June 7, 2016.

### 3.9 Hazards and Hazardous Materials

- California Department of Toxic Substances Control. 2016a. Hazardous Waste and Substances Site List – Site Cleanup (Cortese List). Viewed online at: [http://www.dtsc.ca.gov/SiteCleanup/Cortese\\_List.cfm](http://www.dtsc.ca.gov/SiteCleanup/Cortese_List.cfm). Accessed May 16, 2016.
- . 2016. EnviroStor. [Online Database]. Sacramento (CA): California Department of Toxic Substances Control. Viewed online at: <http://www.envirostor.dtsc.ca.gov/public/>. Accessed: April 13, 2016.

- County of Yolo. 2009. *2030 Countywide General Plan*. Woodland (CA): County of Yolo. Planning and Public Works Department. Viewed online at: <http://www.yolocounty.org/general-government/general-government-departments/county-administrator/general-plan-update/adopted-general-plan>. Accessed: April 2016. Pages Cited: 15, 25–31, 43–55, 63–69, 72–77.
- . 2012. *Yolo County Operational Area Multi-Jurisdictional Hazard Mitigation Plan*. Woodland (CA): Yolo County. Yolo County Operational Area Hazard Mitigation Steering Committee. 135 pp. Viewed online at: <http://www.yolocounty.org/home/showdocument?id=24428>. Accessed April 20, 2016. Pages Cited: 28, 66.
- State Water Resources Control Board. 2016. GeoTracker. [Online Database]. Sacramento (CA): State Water Resources Control Board. Viewed online at: <https://geotracker.waterboards.ca.gov/>. Accessed: April 13, 2016.

### 3.10 Hydrology and Water Quality

- California Department of Fish and Game. 2008. Yolo Bypass Wildlife Area Land Management Plan. Sacramento, CA. Viewed online at: <https://www.wildlife.ca.gov/Lands/Planning/Yolo-Bypass-WA>. Accessed: May 16, 2016.
- California Department of Water Resources. 2003a. *California's Groundwater, Bulletin 118 – Update 2003*. Sacramento, CA. Last Revised: January 15, 2015. Viewed online at: [http://www.water.ca.gov/groundwater/bulletin118/update\\_2003.cfm](http://www.water.ca.gov/groundwater/bulletin118/update_2003.cfm). Accessed: May 1, 2015.
- . 2003b. *California's Groundwater, Bulletin 118 – Update 2003, Sacramento Valley Groundwater Basin, Colusa Subbasin*. Sacramento CA. Last Revised: March 25, 2015. Viewed online at: <http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/5-21.52.pdf>. Accessed: May 1, 2015.
- . 2010a. *Central Valley Flood Management Planning Program, State Plan of Flood Control Descriptive Document*. 2010. Sacramento, CA. Viewed online at: <http://www.water.ca.gov/cvfmfp/docs/SPFCDescriptiveDocumentNov2010.pdf>.
- . 2015a. Rating table for Fremont Weir. Viewed online at: <http://cdec.water.ca.gov/rtables/FRE.html>. Accessed: January 8, 2015.
- . 2015b. Viewed online at: <http://cdec.water.ca.gov/>, compare real time plots for Fremont Weir discharge (FRE) and Verona discharge (VON) for Dec 17, 2005 to January 5, 2006. Pick VON discharge when FRE begins to spill, Dec. 25, 2005. Sacramento, CA.
- . 2015c. Yolo Bypass Salmonid Habitat Restoration and Fish Passage Hydrodynamic Modeling Draft Report. 2014. Sacramento, CA.
- . 2015d. Unpublished data. Soil samples at Fremont Weir Wildlife Area at same locations collected in Heim et al 2010. Collected in March 2015 by David Bosworth and Carol DiGiorgio.



- . 2016. *Central Valley Flood Management Planning Program. Basin-Wide Feasibility Studies, Sacramento River Basin (Draft)*. 2016. Sacramento, CA. Page: 5-5.
- California State Water Resources Control Board. 2011. *2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report)—Statewide*. U.S. Environmental Protection Agency approved: October 11, 2011. Last Revised: August 27, 2015. Viewed online at: [http://www.waterboards.ca.gov/water\\_issues/programs/tmdl/integrated2010.shtml](http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml). Accessed: May 10, 2016.
- cbec, Yolo Basin Foundation, Consero Solutions, and Douglas Environmental. 2014. *Yolo Bypass Drainage and Water Infrastructure Improvement Study, Final Report*. 2014. Sacramento, CA. Viewed online at: <http://www.yolocounty.org/home/showdocument?id=23985>.
- Central Valley Regional Water Quality Control Board. 2011. *The Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins (Fourth Edition)*. Last Revised: June 2015. Viewed online at: [http://www.swrcb.ca.gov/rwqcb5/water\\_issues/basin\\_plans/](http://www.swrcb.ca.gov/rwqcb5/water_issues/basin_plans/). Accessed: May 9, 2016.
- County of Yolo. 2009. *2030 Countywide General Plan*. Last Revised: 2016. Viewed online at: <http://www.yolocounty.org/general-government/general-government-departments/county-administrator/general-plan-update/adopted-general-plan>. Accessed: February 16, 2016.
- Federal Emergency Management Agency. 2012. FEMA Flood Map Service Center: Search By Address. Last Revised: Unknown. Viewed online at: <https://msc.fema.gov/portal/search?AddressQuery=Knights%20Landing%2C%20CA#searchresultsanchor>. Accessed: February 17, 2016.
- Heim WA, A Newman, A Byington, B Hughes, and M Stephenson. 2010. *Spatial Distribution of Total Mercury in the Yolo Bypass: Implications for Land Use Management of Mercury Contaminated Floodplains*. Final Report. Submitted to Chris Foe and the Central Valley Regional Water Quality Control Board. May, 2010.
- Howitt, R, MacEwan, D., Garnache, C., Azuara, J. M., Marchand, P., Brown, D., Six, J., and Lee, J. 2013. *Agricultural and Economic Impacts of Yolo Bypass Fish Habitat Proposals*. Viewed online at: <https://watershed.ucdavis.edu/library/agricultural-and-economic-impacts-yolo-bypass-fish-habitat-proposals>. Accessed: May 16, 2016.
- New York State Department of Health. 2004. *Coliform Bacteria in Drinking Water Supplies*. Viewed online at: [https://www.health.ny.gov/environmental/water/drinking/docs/coliform\\_bacteria.pdf](https://www.health.ny.gov/environmental/water/drinking/docs/coliform_bacteria.pdf). Accessed: November 30, 2016.
- Sommer, T. R., W. C. Harrell, M. Nobriga, R. Brown, P.B. Moyle, W. J. Kimmerer and L. Schemel. 2001. California's Yolo Bypass: evidence that flood control can be compatible with fish, wetlands, wildlife and agriculture. *Fisheries* 26(8):6-16.

United States Environmental Protection Agency. 2008. Regulatory Determinations Support Document for Selected Contaminants from the Second Drinking Water Contaminant Candidate List (CCL 2). Chapter 3: Boron. Viewed online at: [https://www.epa.gov/sites/production/files/2014-09/documents/chapter\\_3\\_boron.pdf](https://www.epa.gov/sites/production/files/2014-09/documents/chapter_3_boron.pdf). Accessed: November 30, 2016.

———. 2016. Learn about Polychlorinated Biphenyls (PCBs). Last Updated: September 15, 2016. Viewed online at: <https://www.epa.gov/pcbs/learn-about-polychlorinated-biphenyls-pcbs>. Accessed November 30, 2016.

United States Geological Survey. 1978. *Hydrologic Unit Map, State of California*. Reston, Virginia.

———. 1999. *The Quality of Our Nation's Waters — Nutrients and Pesticides*. U.S. Geological Survey Circular 1225, 82 pp. Pages Cited: 57–59.

### 3.11 Noise

California Department of Transportation. 2013. *Technical Noise Supplement to the Traffic Noise Analysis Protocol*. Sacramento (CA): California Department of Transportation. 276 pp. Viewed online at: [http://www.dot.ca.gov/hq/env/noise/pub/TeNS\\_Sept\\_2013B.pdf](http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf). Page Cited: Section 2 Page 20; Section 2 Page 27.

County of Yolo. 2009. *2030 Countywide General Plan*. Woodland (CA): County of Yolo. Planning and Public Works Department. Health and Safety Element. 74 pp. Viewed online at: <http://www.yolocounty.org/general-government/general-government-departments/county-administrator/general-plan-update/adopted-general-plan>. Pages Cited: HS-37 through HS-68.

Federal Highway Administration. 2006. *Roadway Construction Noise Model User's Guide*. Cambridge (MA): Prepared by United States Department of Transportation. Research and Innovative Technology Administration. John A. Volpe National Transportation Systems Center Acoustics Facility. Prepared for U.S. Department of Transportation. Federal Highway Administration. Office of Natural and Human Environment. 30 pp. FHWA-HEP-05-054 DOT-VNTSC-FHWA-05-01. Pages Cited: 1, 3, 11, 22, A-1. Viewed online at: [https://www.fhwa.dot.gov/environment/noise/construction\\_noise/rcnm/rcnm.pdf](https://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/rcnm.pdf).

Harris CM, ed. 1991. *Handbook of Acoustical Measurements and Noise Control*. Third edition. New York (NY): McGraw-Hill, Inc. 26 p. [Book].

### 3.12 Recreation

California Department of Fish and Wildlife. 2016a. Yolo Bypass Wildlife Area. [Web page.] Viewed online at: <https://www.wildlife.ca.gov/Lands/Places-to-Visit/Yolo-Bypass-WA>. Accessed: May 18, 2016.

———. 2016b. Sacramento Bypass Wildlife Area. [Web page.] Viewed online at: <https://www.wildlife.ca.gov/Lands/Places-to-Visit/Sacramento-Bypass-WA>. Accessed: May 18, 2016.

———. 2016c. Fremont Weir Wildlife Area. [Web page.] Viewed online at:  
<https://www.wildlife.ca.gov/Lands/Places-to-Visit/Fremont-Weir-WA>. Accessed: May 18, 2016.

California Department of Parks and Recreation. 2011. *Recreation Proposal for the Sacramento-San Joaquin Delta and Suisun Marsh*. California State Parks Planning Division. 40 pp.

California Department of Water Resources. 2013. *Bay Delta Conservation Plan Environmental Impact Report/Environmental Impact Statement*. Appendix 15A, “Privately Owned Recreation Facilities by County.” Sacramento, CA. 7 pp.

———. 2016. Sacramento River Basin-Wide Feasibility Study Technical Appendix, Chapter 15.0, Recreation and Open Space Benefits.

County of Yolo. 2009. *2030 Countywide General Plan*. Woodland (CA). Viewed online at:  
<http://www.yolocounty.org/home/showdocument?id=14464>. Accessed: May 18, 2016.

Tsournos P, RG Miller, and AM Chaudhry. 2016. Economic Value of the Sacramento River to Freshwater Anglers: A Zonal Travel Cost Approach. Contract Report for California Department of Water Resources. Sacramento (CA). 25 pp.

Yolo Basin Foundation. 2016. About the Yolo Bypass Wildlife Area. [Web page.] Viewed online at:  
<http://yolobasin.org/yolobypasswildlifearea>. Accessed: May 19, 2016.

## Personal Communications

Bush, J. Environmental Scientist. California Department of Fish and Wildlife. April 29, 2015 — email correspondence with Douglas Rischbieter, Senior Environmental Scientist, California Department of Water Resources, regarding estimates of past annual visitor use (number of recreation days and types of activities) at Fremont Weir Wildlife Area and Sacramento Bypass Wildlife Area.

## 3.13 Traffic and Transportation

County of Yolo. 2009. 2030 Countywide General Plan, Public Facilities and Services Element. County of Yolo, Planning and Public Works Department. Viewed online at:  
<http://www.yolocounty.org/home/showdocument?id=14466>. Accessed: October 2016. Pages Cited: CI-19, CI-28, CI-29.

Transportation Research Board. 2010. Highway Capacity Manual. Volume 2: Uninterrupted Flow.

## 3.14 Tribal Cultural Resources

Heizer RF, and TR Hester. 1970. *Great Basin Projectile Points: Forms and Chronology*. Socorro, New Mexico. Bellena Press. 43 p.

Krober A. 1932. *The Patwin and Their Neighbors*. University of California Publications in American Archaeology and Ethnology. 29:253-423.

### 3.15 Utilities and Service Systems

County of Yolo. 2009. 2030 Countywide General Plan, Public Facilities and Services Element. County of Yolo, Planning and Public Works Department. Viewed online at: <http://www.yolocounty.org/home/showdocument?id=14466>. Accessed: October 2016. Pages Cited: PF-34, PF-37, PF-38.

### 3.16 Mandatory Findings of Significance

No references.

### 4.00 Cumulative

California Department of Water Resources. 2012. *2012 Central Valley Flood Protection Plan*. FloodSafe California. 192 pp. Viewed online at: [http://www.water.ca.gov/cvfmp/docs/2012%20CVFPP\\_June.pdf](http://www.water.ca.gov/cvfmp/docs/2012%20CVFPP_June.pdf). Accessed: May 2016.

———. 2015. *Draft Central Valley Flood System Conservation Strategy*. 208 pp. Viewed online at: [http://www.water.ca.gov/conservationstrategy/docs/cs\\_draft.pdf](http://www.water.ca.gov/conservationstrategy/docs/cs_draft.pdf). Accessed: May 2016.

———. 2016a. Central Valley Flood Management Planning (CVFMP) Program. [Website.] Viewed online at: <http://www.water.ca.gov/cvfmp/>. Accessed: May 2016.

———. 2016b. *Draft Basin-Wide Feasibility Studies: Sacramento River Basin*. March. 205 pp.

California Natural Resources Agency. 2016a. California WaterFix. Viewed online at: [https://www.californiawaterfix.com/people\\_](https://www.californiawaterfix.com/people_). Accessed: April 2016.

———. 2016b. California EcoRestore. Viewed online at: <http://resources.ca.gov/ecorestore/>. Accessed on: April 2016.

Delta Stewardship Council. 2013. *The Delta Plan. Ensuring a reliable water supply for California, a healthy Delta ecosystem, and a place of enduring value*. 374 pp.

FloodProtect. 2014. *Lower Sacramento River/Delta North Regional Flood Management Plan*. Lower Sacramento Delta North Region. 368 pp. Viewed online at: <http://www.floodprotectplan.com/>. Accessed: April 2016.

ICF International. 2014. *Sacramento River Bank Protection Project Environmental Impact Statement/Environmental Impact Report*. Public Draft. November. (ICF 00627.08.) Sacramento, CA. Prepared for U.S. Army Corps of Engineers and Central Valley Flood Protection Board, Sacramento, CA.

- United States Army Corps of Engineers. 2015a. *American River, California Common Feature Project General Reevaluation Report*. U.S. Army Corps of Engineers, Sacramento District. Final Report. December. 244 pp. Viewed online at:  
[http://www.spk.usace.army.mil/Portals/12/documents/civil\\_works/CommonFeatures/Final\\_ARCF\\_GRR\\_Jan2016.pdf](http://www.spk.usace.army.mil/Portals/12/documents/civil_works/CommonFeatures/Final_ARCF_GRR_Jan2016.pdf). Accessed: May 2016.
- . 2015b. *American River Watershed Common Features General Reevaluation Report Final Environmental Impact Statement/Environmental Impact Report* (State Clearinghouse Number 2005072046). US Army Corps of Engineers Sacramento District, Central Valley Flood Protection Board, Sacramento Area Flood Control Agency. December 2015. Viewed online at:  
[http://www.spk.usace.army.mil/Portals/12/documents/civil\\_works/CommonFeatures/ARCF\\_GRR\\_Final\\_EIS-EIR\\_Jan2016.pdf](http://www.spk.usace.army.mil/Portals/12/documents/civil_works/CommonFeatures/ARCF_GRR_Final_EIS-EIR_Jan2016.pdf). Accessed: May 2016.
- . 2015c. *Environmental Impact Statements notification — Lower Cache Creek Flood Risk Management Project, Woodland, Yolo County, CA*. August 26, 2015. Viewed online at:  
<https://www.regulations.gov/#!documentDetail;D=COE-2015-0014-0001>. Accessed: May 2016.
- . 2016a. Sacramento River Bank Protection Project. [Web page.] Viewed online at:  
<http://www.spk.usace.army.mil/Missions/CivilWorks/SacramentoRiverBankProtection.aspx>. Accessed: April 2016.
- . 2016b. Sacramento River General Reevaluation Report. [Web page.] Viewed online at:  
<http://www.spk.usace.army.mil/Missions/CivilWorks/SacramentoRiverGRR.aspx>. Accessed: April 2016.
- Yolo Habitat Conservancy. 2016. The Yolo Habitat Conservancy. Viewed online at:  
[http://www.yolohabitatconservancy.org/#!about/cjg9\\_](http://www.yolohabitatconservancy.org/#!about/cjg9_). Accessed: May 2016.





